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BULLETIN OF THE HISTORY OF MEDICINE

Organ of the American Association of the History of Medicine and The Johns Hopkins Institute of the History of Medicine

Editor—Henry E. Sigerist

Associate Editor—Genevieve Miller

Volume XXI SEPTEMBER–OCTOBER, 1947 Number 5

TRANSACTIONS OF THE TWENTIETH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE

Held at Cleveland, Ohio

May 25 and 26, 1947

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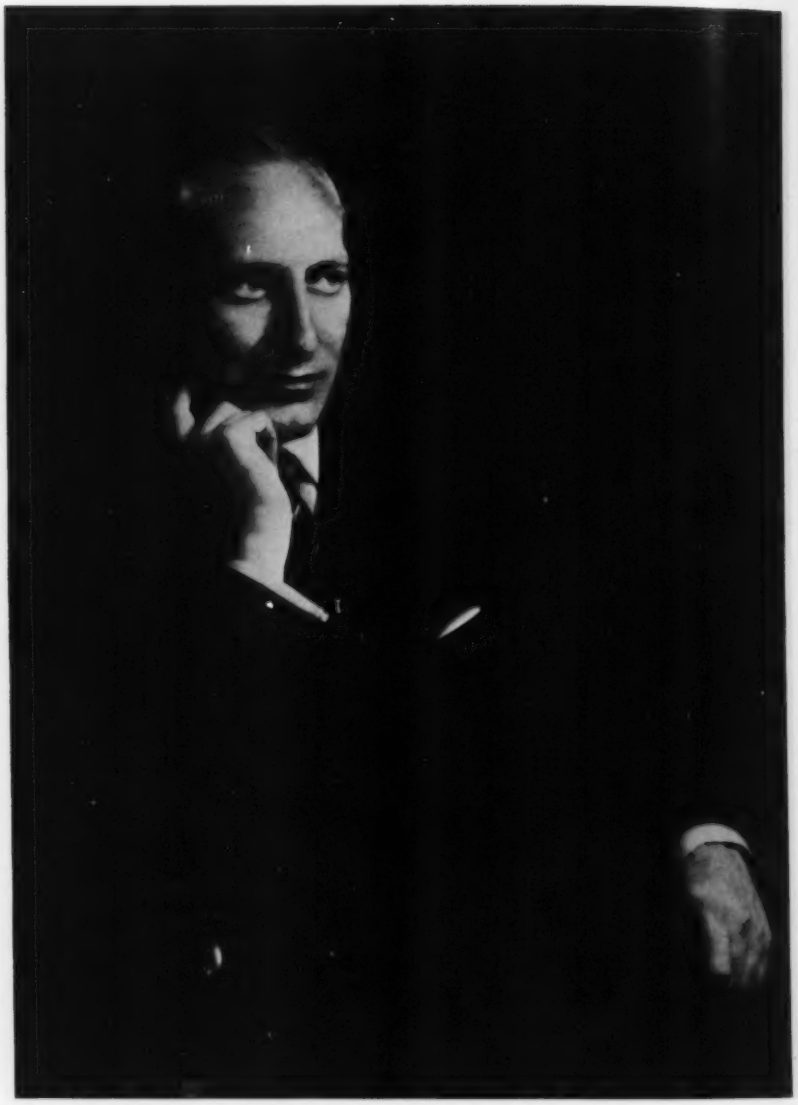


Dr. E. Ashworth Underwood
Fielding H. Garrison Lecturer, 1947.

THE FIELDING H. GARRISON LECTURE

APOLLO AND TERPSICHORE: MUSIC AND THE HEALING ART

(with special reference to B. M. Berenclow, F. N. Marquet and F. K. Harford)*

E. ASHWORTH UNDERWOOD

Mr. President, Members of the American Association of the History of Medicine, and guests:

When I received the invitation to deliver this fifth annual discourse dedicated to the memory of Fielding H. Garrison, my first thought was of the signal honour which was thus bestowed on British scholarship. The difficulties associated at the present time with a rather indefinite absence from London have been many, and the fact that I am actually here to deliver this address is the highest mark of appreciation which I am able to offer. In my mind there could be no doubt that chance had played its part in temporarily casting on my shoulders the mantle of historical research, since there are obviously others who could with greater scholarship and greater dignity deliver an address worthy of Garrison's own attainments. In the name of my fellow-workers and of myself I thank you most sincerely.

The choice of my subject was made, not by me but by Garrison himself. It was obviously desirable to choose a theme which would be of wide interest on both sides of the Atlantic, and which moreover would be smiled upon by Garrison were he still with us. I could think of nothing more appropriate to his memory than some reflections

* It might be thought that I should have chosen as the title of this lecture the phrase "Apollo and Euterpe," since Euterpe with her double flute is classically regarded as the muse, not only of lyric poetry, but of music. In view of the fact that many of the earlier "cures" by music result in dancing or in rhythmical movements, and in view also of the prominence which tarantism must take in any complete history of the subject, it seemed fitting to include Terpsichore in the title.

upon music and the healing art—a subject already graced by Garrison's own writings, and made yet more appropriate by virtue of his ability as an executant and by the place which music filled in his life.

Medical Musicians.

In this address I propose to attempt three things: (1) to trace the growth of scientific ideas regarding the relation between music and medicine; (2) to show the development of the practical application of these ideas; and (3) to make certain observations on matters which have not been previously recorded.

It is inevitable that I should, at some point in this discourse, say something about those medical men who have distinguished themselves by their knowledge of music. This aspect is rather foreign to my main theme, and I therefore propose to deal with it now. It has been treated sympathetically by other writers before me, not least by Fielding Garrison himself. I have notes on well over 200 of these interesting men, but I would refer you to the writings of, among others, Gillespie,[1] Podolsky,[2] Weinfield,[3] and Marmelszadt.[4] I will mention only a very few, and say something about two men who have not been previously noted in this category.

Borodin was undoubtedly the greatest of all musicians who belonged to the medical profession. Although he had graduated in medicine, it was of course as a chemist that he achieved scientific fame in his lifetime. A professor at the Academy of Medicine in St. Petersburg when he was 28 years old, he assisted at the founding of the school of medicine for women. His association with Balakirev, Cui, Rimski-Korsakov and Moussorgsky to form "The Five" was an important event in the history of music. One wonders what this professor of chemistry would have done had he been able to free himself from some of his other innumerable commitments.

[1] Gillespie, W. F.: *Canad. Med. Assn. Journ.*, 1935, xxxiii, 676-79.

[2] Podolsky, E.: *Amer. Med.*, 1931, xxxvii (N. S. xxvi), 99-104; *Canad. Med. Assn. Journ.*, 1934, xxx, 195-200.

[3] Weinfield, E.: *Ann. Int. Med.* 1929-30, iii, 1046-1054.

[4] Marmelszadt, W.: *Musical Sons of Aesculapius.* N. York, 1946.

Berlioz, the greatest musician *associated with* medicine, hardly counts, since he was merely a medical student for a short time by force of circumstances. Among theorists Helmholtz stands *facile princeps*. His *Tonempfindungen*[5] is a classic which has inspired most of the later work. Émile-Joseph-Maurice Chevé also has a permanent place in the history of music, especially as a result of his joint work on the tonic-sol-fah system. Athanasius Kircher in his *Musurgia Universalis* (Rome, 1650) inaugurated attempts to associate music and colour, and further described the first composing machine. The *Treatise on Harmony* (1845) of Alfred Day was a standard and in many ways a revolutionary work. Sir George Macfarren was an ardent supporter of Day's work, and it is now recognised that he proposed some reform in almost every branch of the scientific aspect of music. The writings of Caspar Bartholin and of Kist are on rather a different plane. The work *De tibiis veterum* by Bartholin is a study of the double flutes of Greece. Kist organised musical societies in Delft, and founded the music journal *Cecilia*.

I have selected—almost arbitrarily—a few composers for brief mention. Of these Auenbrugger, (though as a librettist, hardly a composer of *music*) is the greatest *man*.[6] William Kitchiner[7] is probably the most prolific composer; and Thomas Campion,[8] Henry

[5] Helmholtz, H.: *Die Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik*. Brunswick, 1863.

[6] Auenbrugger (1722-98) wrote the libretto of Salieri's opera *Der Rauchfangkehrer* (*Le Ramoneur*). See Hoefer under Auenbrugger and Salieri.

[7] William Kitchiner (? 1775-1827) was educated at Eton and graduated M. D. at Glasgow. In addition to writing many sea songs and editing others, he composed an operetta, *Love among the Roses*, and a musical drama, *Ivanhoe, or the Knight Templars*. He also wrote *Apicius Redivivus, or the Cook's Oracle* (1817), which went into a seventh edition, and on optics.

[8] Thomas Campion (1567-1620) was probably educated abroad, but he is mentioned as a 'doctor in phisicke' in 1607, and as 'physician' in 1616. His Latin and English poems are of considerable importance, and his *Books of Ayres* are significant. His work on counterpoint went into three editions, the last (1672) having the title *The Art of Discant with Annotations*. Hoefer mentions that in one of his works he follows the example of Galen in apologising for having written a treatise on music.

Harington[9] and John Arbuthnot,[10] though hardly of importance in the history of music, have had their names preserved, each with one well-known composition, or group of compositions. In the recent period I should like to pay a tribute to the late John C. Hemmeter, who as composer, theorist and executant deserves a high place. In passing I mention the association of Billroth and of Engelmann with Brahms, but the story is too well-known to bear repetition here.[11]

The spirit is not dead. Albert Schweitzer has gained distinction in many fields, and his work on Bach will long remain a classic. Boyd Neel,[12] the founder and conductor of a famous London string orchestra, is a doctor. When war broke out he laid down his baton, and went back to active medical work in the wards. Reference does not seem to have been made previously to that fact that J. G. Adami, the pathologist and late Vice-Chancellor of the University of Liverpool, wrote music. I have seen a printed copy of an anthem, *Lighten our Darkness*, composed by him, and published at Liverpool in 1922. I should also mention that Charles Creighton (1847-1927), the erudite author of *A History of Epidemics in Britain*, was a great lover of music. While he was in London he was a frequent attender at St. Paul's Cathedral and at orchestral concerts.[13]

Of the two new examples which I shall quote, the source material of one has been printed, but the man himself has not yet made

[9] Henry Harington (1727(1728 ?)-1816). Studied medicine at Oxford, and received his doctorate in 1762. He practised medicine at Wells and then at Bath. He founded the Harmonic Society of Bath, and composed many glees and songs. He published *Nugae antiquae, a Collection of original papers written in the reigns of Henry VIII, Queens Mary and Elizabeth*, Oxford, 1769, 1775 and 1779. His best known musical composition is the hymn tune "Harington." [Hoefer, etc.]

[10] John Arbuthnot (1667-1735), the physician, wit, and friend of Pope. He wrote a number of anthems, the best known of which is *As pants the hart*.

[11] For references to Billroth and Engelmann, see Marmelszadt, Gillespie, etc. See especially Billroth's *Briefe*. Billroth published a work on the physiology and psychology of music entitled *Wer ist Musikalisch?*

[12] Louis Boyd Neel, b. 1905. Educated at Royal Naval College, Dartmouth and Caius Coll., Cambridge. Qualified as a doctor in 1930. House Surgeon and House Physician at St. George's Hosp., London. Founded the Boyd Neel String Orchestra in 1933, and forsook medicine. He has conducted his orchestra all over Europe, and also other well-known orchestras.

[13] Bulloch, W.: Obituary of Creighton in *Aberdeen Univ. Rev.*, 1928, xv, 112-118.

his way into the history of medicine in this connection. He is Dr. Claver Morris, who was born in Dorsetshire in 1659. He graduated B. A. and later M. A. from New Hall, Oxford. In 1685 he graduated M. B., and M. D. in 1691. He probably practised first at Salisbury, but coming to Wells in 1686, he remained there until his death in 1726/7 in his 67th year. Morris left a diary (Fig. 1) which covered the period from 1684 until the year of his death, and this diary was recently edited by Dr. Edmund Hobhouse.[14] From it we learn that Morris must have lived a busy professional life, often spending forty hours a week in the saddle. His musical life was certainly extremely active. He founded a "Musick-Clubb" in Wells which survived until his death, and he was generally the centre of the musical life of the city. Morris sang, and also played the organ, the harpsichord, the violin and double bass, the flute, oboe and bassoon. He had a large collection of music. He seems to have been an authority on organ construction, and his advice was also asked for on other instruments. He invented improvements for the harpsichord. Three extracts from his diary will suffice to indicate his versatility, and his love of music.

1718, Sept. 26: "We continued at Bath. I was called in to Mr. Harington at Kelston. I got Mr. Du Burg, Mr. Shojan, Mr. Walter, and Mr. David Baswiwaldt, to go with me. We Dined there, and had a Consort of Musick. We returned to Bath in the Evening; and I entertained them with 3 Fowles and Wine in the great new Dining-Room at the 3 Tuns, where I had a Performance of Musick by these extraordinary hands."

1718, Sept. 30: "We all went to our Music-meeting in the afternoon, and we performed Concertos very exactly, and had the 6th Mottet of Scarlati which was very fine."

1720, Sept. 27: "I was at our Musick-meeting. Vivaldi's Concerto call'd The Cuckoe, & the Extravagant were very well playd."

Morris ended his will with these words: "My desire is that there might be no appearance of concernment or Grief amongst even my nearest relations or Friends; but if it be possible, there might be a concert of music of 3 Sonatas at least in the room where my body is placed before it be carried out of my house to be interred."

[14] *The Diary of a West Country Physician, A. D. 1684-1726.* Edited by Edmund Hobhouse, M. D. London, 1934.

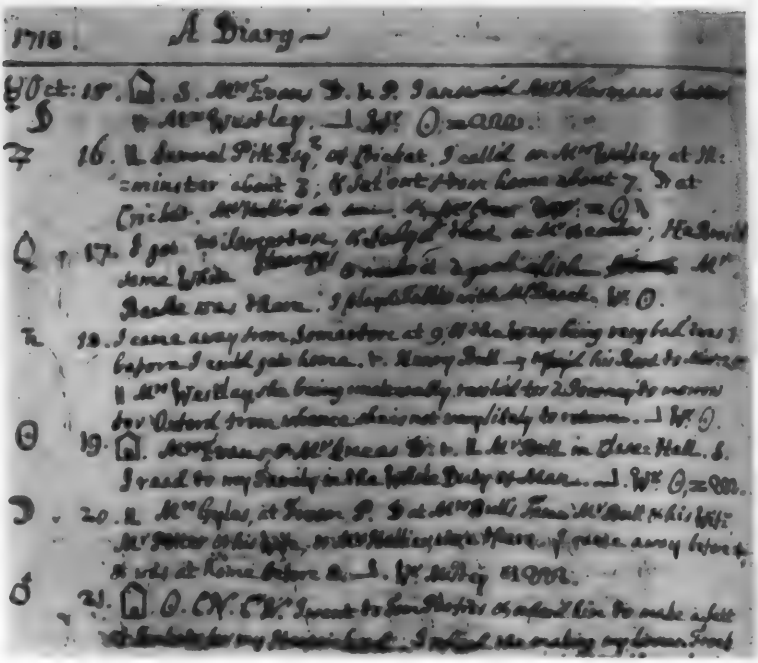


Fig. 1.

A specimen page of the diary of Claver Morris. Reproduced from E. HOBHOUSE, *The Diary of a West Country Physician* (1934).

The other example which I shall give is, I believe, quite unknown in this connection. In the British Museum there is a manuscript music book which contains an air to the words "Stelle che remirate." The music is by Bernard Martin Berenclow, and I was at first led to believe that he was "Dr." Berenclow. This turned out to be incorrect, but in actual fact there was a "Dr. Berenclow," who was the father of Mr. Bernard Martin Berenclow, the composer of this air.[15] Though Dr. Berenclow has proved singularly elusive, there are a number of records of the activities of the son. Berenclow the younger was a prominent composer in the reign of Queen Anne, and his compositions appear in the same music books as those of the Purcells, Blow, the Clarkes, Ackroyd, and others. In their bibliography Day and Murrie[16] list one composition—"Behold our happy isle does once again" (1702)—in which both words and music are by Bernard Martin Berenclow, and seventeen other airs in each of which the music is by him. Now the dates of these compositions all fall within the period beginning in 1689 and ending in 1702, with a single exception. The exception is "'Tis a foolish mistake that riches can speak," which was published in *Joyful Cuckoldom, or the Love of Gentlemen, and Gentlewomen*, London, 1671. The interval of eighteen years between the publication of this song and the earliest of the others suggests that it is by a different person—presumably Berenclow the father. The works by "Bernard Martin Berenclow" in the *Catalogue of Printed Music in the British Museum* all date between 1700 and 1715, but some of them are admittedly late editions. Walker makes a sympathetic reference to the work of Berenclow the younger. He says: "Here and there, even among the works of quite inferior men we come across something good, as, for example (in the sixth book of *The Banquet of Music*) the really notably beautiful, as well as very clever, 'Be gentle, Phillis,' by Barrincloe, finely organised on an exceedingly simple ground-bass."[17]

There are certain manuscript music items in the hands of the Berenclows in the Harleian collection, and in the catalogue entry

[15] B. M. Harley 1273, f. 14.
[16] Day, C. L. and Murrie, E. B. *English Song Books, 1651-1702*. London, 1940.
[17] Walker, E.: *A History of Music in England*, 2nd. edit. London, 1924, p. 175.

for No. 1265 Wanley has an important note. This music book contains thirty-five items. All are airs by Carissimi, by Luigi Rossi, and Scarlatti. The nineteenth is an air entitled "Sospiri miei di foco," by Luigi Rossi. Fig 2 is a photograph of this manuscript. With reference to this item Wanley says:

> This is of the hand-writing of Doctor Bernard-Martin Berenclow, father to Mr. Bernard-Martin Berenclow mentioned in the account of No. 1264. I take leave to mention, that this Doctor Berenclow was born in the Dutchy of Holstein near Toninghen; his mother was a Berchem, a family sufficiently eminent both in the Upper and Nether Germany. He married Katherine one of the daughters of Mr. Laneir, Clerk of the Closet to K. Charles I. He was Professor of Physic in the University of Padua, & practised with success and reputation in Italy, France, Germany, Holland, Flanders & England. And notwithstanding his frequent Journeys & Removals, died rich in ready Money, Jewels, Plate, Pictures, Drawings, &c. of great price & curiosity; which his Widow notwithstanding (by true pains-taking) made a shift to overcome, and utterly squandered away, in about five years time after his decease.[18]

Some of this passage is quoted by Hawkins,[19] and he refers to Mr. Berenclow — probably the son — as "a musician of some eminence in Queen Anne's reign."

The Harleian MSS. contain certain other items—*e. g.* No. 1270—written partly by the hand of Mr. Berenclow, and "partly by Doctor Berenclow, his father." These are mainly copies of airs by others. But Harley No. 1863 is very interesting. It contains forty-eight airs, by various composers, copied by Mr. Berenclow. But of the first item Wanley says:

> 1. Registro del libro presente (this is by Dr. Berenclow, father to the former).

It appears therefore that Dr. Berenclow was certainly interested in music, and it is therefore probable that the music of "'Tis a foolish mistake"—written in 1671—was also by him.

There are only two manuscripts by Dr. Berenclow in the British Museum. One is a medical treatise,[20] written presumably in his

[18] Cat. Harleian MSS., Vol. I, p. 640.

[19] Hawkins, Sir John: *A General History of the Science and Practice of Music.* London, 1875. Vol. ii, p. 653.

[20] B. M. Harley 6816.

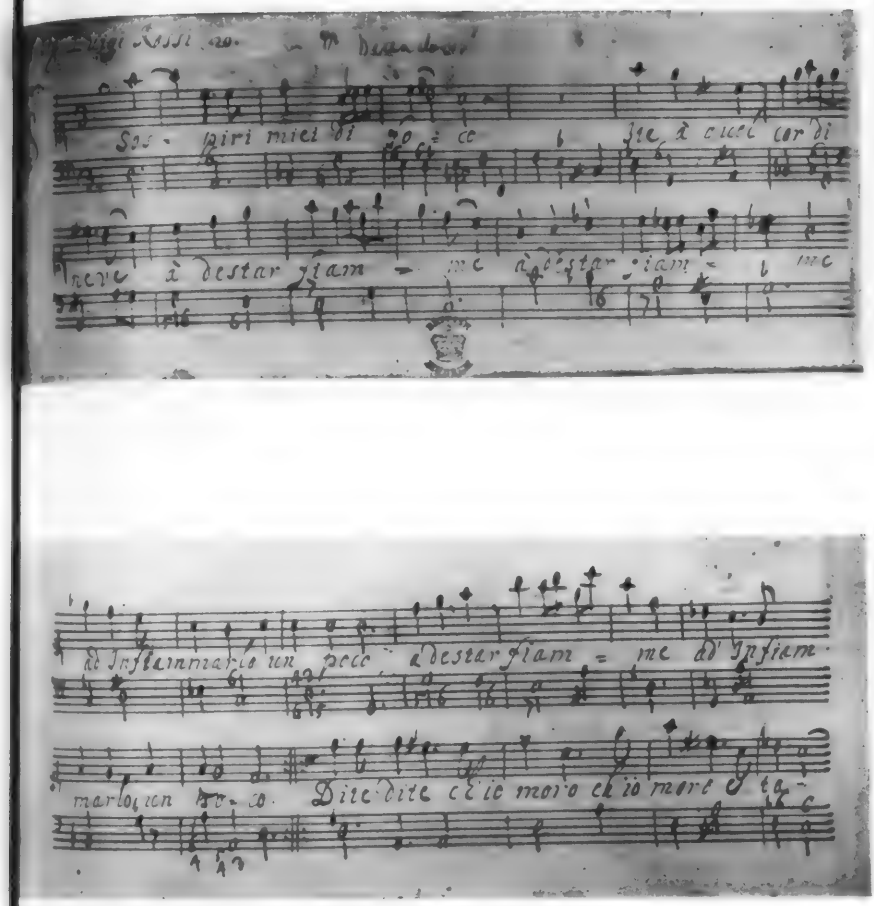

Sos - piri miei di vo = ce
ne ve à destar gliam - me à destar gliam - me
Infiammarlo un poco à destar gliam = me d'Infiam
marlo un poco. Dite dite ch'io moro ch'io more

Fig. 2(a) and (b)

First two pages of an air of Luigi Rossi, in the handwriting of Dr. B. M. Berenclow.
(Brit. Mus. Harleian MS. 1265, f. 167 r. and 167 v.)

hand throughout on paper measuring approximately six-and-a-half inches wide by eight-and-a-half tall. It contains 94 pages. On the title page occurs the following inscription in his hand:

Medicina practica, seu de Cognoscendis discernendis et curandis omnibus humani corporis affectibus
Docr. Bernhardi Martini Berenclow
Caroli secundi magnae Britanniae Franciae et Hiberniae Regis medici ordinarii.

I have looked through this treatise, and I find that it contains nothing of biographical interest. Its medical content is a summary of the knowledge of his time.

The other Berenclow manuscript is a letter, dated from Bristol on 25th Jan., 1661 from Dr. Berenclow to John Evelyn.[21] The fact that it is written by "Dr."—and not "Mr."—Berenclow is stated in the printed catalogue. The text of this letter is as follows:

Sir Nobilissime et Amplissime

Medicus hic gallus commendatus mihi a viris eruditionis fama florentibus greenwec' [i. e. Greenwich] se confert simul et practicum consulens et quarens profectum ex virorum literatorum amicitia, tibi igitur tradendum existimavi qui mihi semper primus amicorum fuisti pluribus uterer verbis nisi scirem id a me peti quo te sponte fert bonitas tua. Tibi tuaeque Matronae ac familiae ut ex animo succedant omnia, opto ego, optat mecum uxor.

25 Januar: Ann 61

—Bristolliae

Tuus observantissimus

B. M. Berenclow

This manuscript is reproduced as Fig. 3. It gives little biographical information, beyond showing that in 1661 Berenclow was probably in an established position, and on terms of some familiarity with men of the calibre of John Evelyn. I have not been able so far to confirm or refute Wanley's statement that Berenclow had been a professor of Padua or to confirm the fact that Berenclow was a physician-in-ordinary to Charles II.

The only other particulars which have come to light which might

[21] B. M., Addit. MSS., 15,857, f. 37.

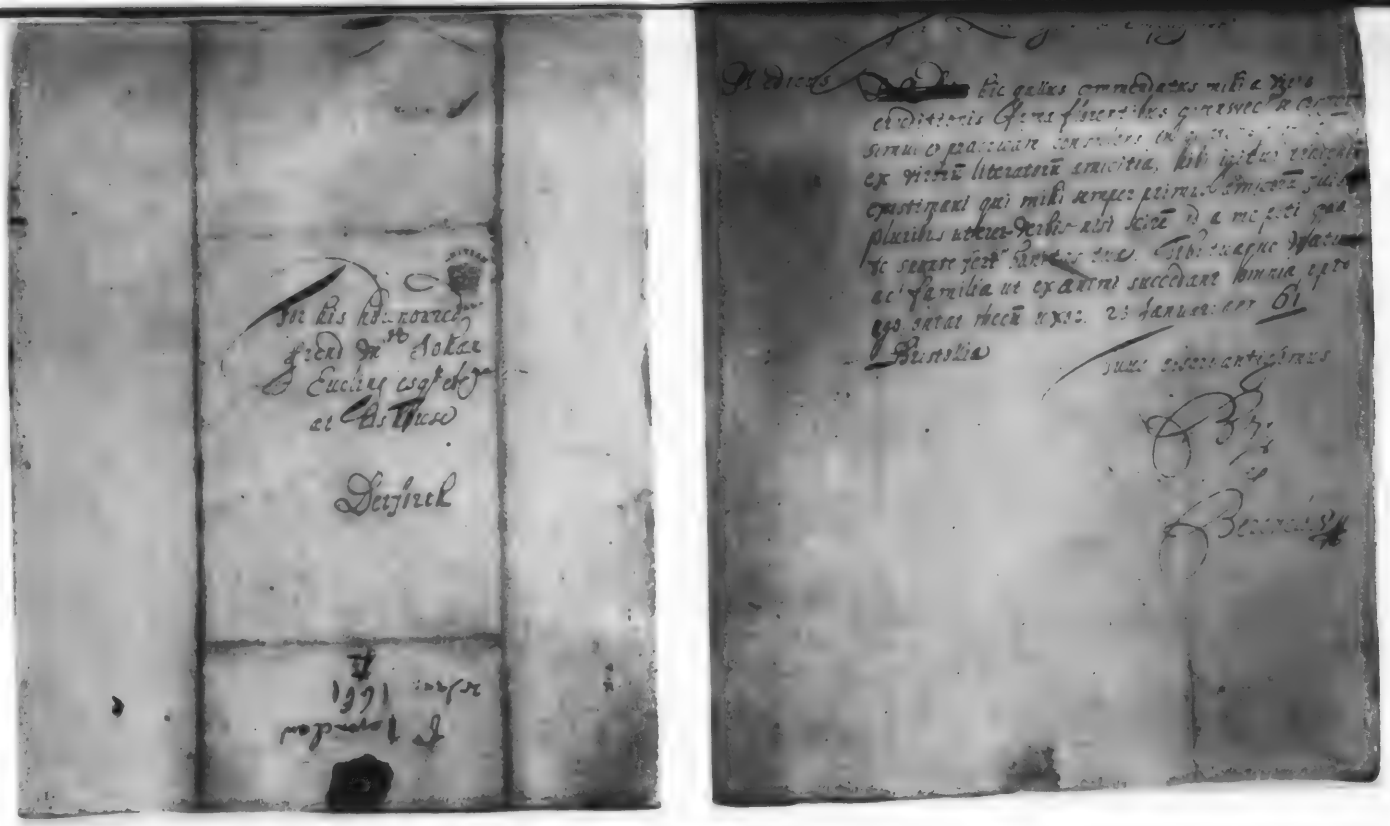


Fig. 3(a) and (b).

Manuscript letter from Dr. B. M. Berenclow to John Evelyn.
(Brit. Mus. Addit. MSS. 15,857.)

have some bearing on the lives of these two men relate to certain marriages. It is recorded [22] that on Jan. 1, 1691/2 Elizabeth Berenclow married Cornelius Vandervelden, and it is probable that she was Dr. Berenclow's daughter. Wanley's rather scathing reference to the manner in which Dr. Berenclow's widow squandered her husband's estate after his death is probably explained by the facts of Wanley's own first marriage. Wanley compiled the catalogue of the Harleian collection in 1708, and since the widow squandered the estate in five years, Dr. Berenclow must have died not later than 1703. But from Wanley's own journal it appears that on May 1, 1705 he married his first wife, Mrs. Anna Berenclow, a widow, by whom he had three boys, not one of whom survived more than a day.[23] From another source however it appears that Wanley had a son named Humphry by his first wife; this son survived and married. If Wanley had married *Dr.* Berenclow's widow, he would hardly have been likely to make the admission that his wife had squandered her first husband's fortune. If on the other hand he had married the widow of Berenclow the younger, he would have had some justification for complaining about his mother-in-law's conduct.

In the British Museum there is one printed work by Dr. Berenclow. This is *Ottoman Gallantries or the Life of the Bassa of Buda. Done out of French*, London, 1687. The dedication is to William, Lord Cavendish, and is signed by " B. Berenclow." This is probably Dr. Berenclow, and the translation is also almost certainly by him.

The dates of the airs by Bernard Martin Berenclow (*i. e.* the younger) given by Day and Murrie, to which I have referred, are all consistent with the supposition that he died sometime between 1702 and 1705. On the other hand his printed airs which appear in the *B. M. Catalogue of Printed Music* are dated much later. This is explained by the fact that these later publications were new editions—an observation which supports the view that in the reign of Queen Anne Berenclow was a very popular composer. These deduc-

[22] *Registers of Marriages of S. Mary le Bone, Middlesex, 1668-1754.* . . . Pub. of the Harleian Soc. London, 1917, p. 186.

[23] Wanley: Harleian Journ. (Lansdowne MSS. 771, 772). See J. A. C. Vincent in *The Genealogist*, N. S. vol. I, pp. 114, 178, 256. Also *Notes and Queries*, 4th series, V, p. 143.

tions are also consistent with the supposition that Wanley married his widow in 1705.

Classical Associations between Music and Medicine.

I would like to emphasise that in what follows I am dealing with the subject historically, and I therefore make no pretence to mention any work later than the year 1900.

The supposed association between music and medicine is as old as written literature. How could it be otherwise? From time immemorial the uplifting effect of music has been known to man. When Shelley said

> The dissolving strain, through every vein,
> Passes into my heart and brain

he epitomised the power of the art of Apollo to "Cleanse the stuff'd bosom of that perilous stuff, which weighs upon the heart." Psychological medicine if you like, but nevertheless medicine of a certain kind. There is all the difference in the world between the enhancement of the *vis medicatrix naturae* by the virtues of music and song on the one hand, and, on the other, observation of the specific effects of music on the human body, and attempts to use these effects in a practical and scientific manner.

It is surprising that so little information has come down to us regarding the therapeutic use of music by the Egyptians. There seems a likelihood that the incantation in music in the Petrie papyrus was simply an example of many such—for the Egyptians were incantation-minded. They probably used the flute, the pipe and the harp in these incantations.[24]

The Greeks entered the field fully armed and won a notable victory right at the beginning. To Homer, greatest of poets, goes the laurel for his successful use of music as a therapeutic agent in the difficult field of surgery. It is only now, after nearly 3000 years, that music is again being used in surgery—though from rather a different aspect than the stanching of the blood from

[24] The incantation in the Petrie papyrus is mentioned by several authors, but I have been unable to find it in the original.

Ulysses' wound. We may pass over with the briefest reference those examples in the literature of the ancient Greeks which extol music not merely as a universal moral panacea, but even as an ethical prophylactic which must have been of the greatest value not only to the individual but to groups, communities and even nations. The differences between the Arcadians and the Cynetes of which Polybius speaks lie quite outside our field. One is inclined to dismiss as mere romance the incitatory influence of music as exemplified by the acts of Terpender, of Tyrtaeus and of Solon; but the example of Rouget de Lisle in modern times may give us pause. The enormous emphasis which Plato placed on the teaching of music is evidence that it probably filled a role in the daily life of the ancients which is difficult for us to understand. When we approach the subject with this background, we can perhaps appreciate the part which the art would play in the mind of a physician of antiquity. We appreciate, but do not understand, a treatise such as the *Deipnosophistae* of Athaneus, in which the flageolet is praised as a remedy for many conditions. A few concrete examples of the therapeutic action of music will perhaps show that its effect may not have been merely imaginary. Both Theophrastus and Aulus Gellius claimed that sciatica could be cured by the notes of a flute. The type of instrument used for such cures seems to have been immaterial: the main virtue of the music probably was that it ensured rest, and rest gave relief from pain. On the other hand, we may dismiss as imaginary the claim of Democrates that the music of flutes was a remedy against the plague; and the same would apply to the myth that Tales, the Cretan, actually stopped a plague at Sparta by these measures. Aesculapius was credited with having used the trumpet for deafness—but what other choice could he make? Both Cicero and Celsus appear to have been satisfied with the beneficial effect of music in mental illness. Celsus says of the treatment of the insane: "Others need to have their violence restrained as is done in the case of those who are controlled even by flogging. In some also untimely laughter has to be put a stop to by reproof and threats; in others, melancholy thoughts are to be dissipated, for which purpose music, cymbals, and noises are of use." [25] There is

[25] Celsus. Ed. Spencer (Loeb). Book III, 10.

something to be said for the dictum of Aristoxenes that music is good with meals, since mental and physical excess are restrained by its sublime symmetry. Macrobius endows music with the double virtue of persuading to clemency and healing diseases. We may note in passing that both Alcibiades and Diogenes were against the use of music for curative purposes.

The Dark Ages and Medieval Times.

As might be expected, succeeding centuries up to the modern period contributed nothing to the assessment of any possible influence of music as a therapeutic agent. It is stated that among the Scandinavian peoples songs and runes were used "to heal or make sick, bind up wounds, stanch blood, alleviate pain, or lull to sleep." The *Havamal*—an ancient Icelandic poem—contains the verse: "I am possessed of songs, such as neither the spouse of a king nor any son of man can repeat. One of them is called 'the Helper.' It will help thee at thy need, in sickness, grief, and all adversities. I know a song which the sons of men ought to sing, if they would become skilful physicians." [26]

There is little doubt that the Anglo-Saxons appreciated the general mental elevation which music conferred, but it is rather difficult to distinguish references in their literature. This is largely because their therapy was not only highly polypharmacic in nature, but depended so much on charms and incantations in addition to drugs. Bede, as an invaluable commentator on the customs of his time, is disappointing in this respect. There is one passage which exemplifies the part which church music was expected to take in the general treatment of a body *in extremis*. Bishop Wilfrid while journeying through France to Britain fell sick and had to be carried in his bed.

> Being thus come to the city of Meaux, in France, he lay four days and nights, as if he had been dead, and only by his faint breathing showed that he had any life in him; having continued so four days, without meat or drink, speaking or hearing, he, at length, on the fifth day, in the morning, as it were awakening out of a dead sleep, sat up in bed, and opening his eyes, saw numbers of brethren singing and weeping about him, and fetching a sigh.

[26] Havamal; See M. Mallet, *Northern Antiquities*, p. 351, quoted by R. M. Lawrence, *Primitive Psycho-therapy and Quackery*. London, 1910, p. 179.

asked where Acca, the priest, was? This man, being called, immediately came in, and seeing him thus recovered and able to speak, knelt down, and returned thanks to God, with all the brethren there present.[27]

In the Anglo-Saxon leechbooks I know of at least twenty charms which depend for their efficacy on their being sung. As an example, a drink for a fiend-sick man will suffice. To prepare the drink, take githrife, cynoglossum, yarrow, lupin, betony, attorlothe, cassock, flower de luce, fennel, church lichen, lichen, Christ's mark or cross, and lovage. Work these up with clear ale, sing seven masses over the worts, add garlic and holy water. The concoction, thus blessed, is to be added to every drink which the patient has subsequently. Before he takes the drink he must sing the psalm *Beati immaculati*, the *Exurgat* and the *Salvum me fac, deus*. The drink is to be taken out of a church bell, and after the patient has taken it, the mass priest shall sing over him the *Domine, sancte pater omnipotens*.[28] Who shall say what virtues were ascribed to the herbs, what to the religious significance of the words, and what to the music?

This may be a convenient point to refer to the fact that the classical tradition of a liberal education for the physician persisted into the Middle Ages and later, and many held that music formed part of this education. The dictum of Plato was upheld by Galen, who believed that music, rhetoric, astronomy and geometry should also form part of the education of a good physician.[29] Lynn Thorndike quotes Peter the Deacon as saying that Constantinus Africanus studied in his youth grammar, dialectic, geometry, arithmetic, mathematics, astronomy, music and necromancy, in addition to physics or medicine.[30] Thorndike also refers in other parts of his monumental work to the cases of Lorenz Fries and of Henri de Monantheuil. Fries [31]—Laurentius Frisius—wrote the *Spiegel der Artznei* (1518), in which he states that the only doctors worthy of confidence are rational physicians possessing academic degrees and a knowledge of grammar, logic, astronomy, arithmetic, geometry, music, cosmog-

[27] Bede, *Eccles. Hist.* Everyman edit. Book V, ch. xix, p. 261.
[28] Cockayne, *Leechdoms*. Vol. II, lxiii, 137-139.
[29] Galen: Kühn, X, 16.
[30] Thorndike, *Hist. Magic and Exp. Sci.*, I, 123.
[31] *Ibid.*, V, 430.

raphy, and especially natural science. In the *Ludus iatromathematicus* (1597), Monantheuil cites ancient and more recent medical authors in favour of the union of medicine and mathematics. He there shows the utility for medicine of certain other subjects, one of which is music.[32]

Tarantism. Somewhat analogous to these mystic charms was the supposed power of music to cure the curious psychological condition which was known as tarantism. This strange disease had its ups and downs during several centuries, and many famous writers have contributed to its literature. I mention only in passing Athanasius Kircher, P. J. Burette, Giorgio Baglivi, Théodore Craanen, P. J. Schneider, and Hecker. Less known is the work by Samuel Hafenreffer of Ulm, published in 1640.[33] It may be called the *Nosodochium*. It is a treatise on skin diseases, and in it Hafenreffer devotes 42 pages to tarantism. He says that the instruments most commonly used in treatment were the drum, the cornemuse (a species of French bag-pipe), the trumpet, the cithern, and the harpsichord, either singly or in concert. Other writers had recommended clarinets and drums, and Hecker says that the flute and the cithern were most used. Hafenreffer gives examples of some of the songs which were employed. These consist partly of jargon, and are difficult to translate. The choice of the particular tune or song depended upon the nature of the poison and the preference of the individual who was treated. Hafenreffer also gives a full description of the effect of the music, and of the lengths to which matrons, *ruptis vinculis omnis modestiae,* might be driven by it.

Another little known early writer on this subject is Wolferdus Senguerdius, who delivered an inaugural oration—*De usu et dignitate philosophiae*—as a Doctor of Philosophy at Leyden in December, 1667. In the following year Senguerdius published his treatise on the tarantula.[34] In this work Senguerdius first discussed the

[32] *Ibid.*, VI, 141.

[33] Hafenreffer, S.: *Nosodochium in quo cutis, eique adhaerentium partium, affectus omnes, singulari methodo, et cognoscendi et curandi fidelissime traduntur.* Ulm, 1660. (For an interesting article on this work, see L. Francesco, *Boll. dell' Istit. Storico Ital. dell' Arte Sanitaria*, 1929, ix, 139-145.

[34] Senguerdius, W.: *Tractatus physicus de tarantula*, Lugd. Bat., 1668. (Copy in the Wellcome Historical Museum.)

anatomical characters, habits and types of the tarantula, quoting liberally from Pliny, Athanasius Kircher, Petrus Bellonius and Aldrovandus. Similar authorities are quoted on the results of the bite. Towards the end of the work he considers the reasons why a bite produces ill effects only in Apulia, and he believes that the temperature explains the phenomenon. In discussing the manner in which the poison of the tarantula acts, he asserts that after a year it becomes subtilised by the heat of the sun, and because of this it is enabled to penetrate into the body (*ob sui tenuitatem, & majorem attenuationem, magis penetret ad interiora ejus cui nocuit*). In this way the poison passes to the arteries, nerves and the spirits contained in them, as also to the muscles and brain. Kircher had said that persons suffering from tarantism are affected specially not only by sounds and dancing, but even by certain colours. Senguerdius discusses this point fully, and concludes that such persons are not affected only by certain colours, nor does a tarantula tend to be attracted specially by such colours. He believes that dancing effects a cure by causing perspiration. Sudorifics such as theriaca would not cause this result.

There is an impression that tarantism died out in the seventeenth and eighteenth centuries. This is not so. Early in this present twentieth century Visseti stated that in a Dalmatian town he had seen the people leaving their work and trades to give themselves up to unbridled dance. One could see " girls, women, sick people of all ages, men falling to the floor as though they were real epileptics, some swallowing stones, pieces of broken glass, and burning coals." [35]

References to tarantism have passed into the literature of our tongue. In 1662 Pepys referred to what he had been told by one who had travelled in Italy: " there are fiddlers go up and down the fields everywhere, in expectation of being hired by those that are stung." [35] But much earlier references occur. Sir Philip Sidney in *Arcadia*, published in 1590, wrote: " The word did not less pierce poor Pyrocles, than the right tunes of music toucheth him that is sick of the tarantula." In 1704 Swift wrote in *The Tale of a Tub* that one of his characters " was troubled with a disease, reversed to that

[35] Scholes: *Oxford Companion to Music*. London, 1938, p. 920.

called the stinging of the tarantula, and would run dog-mad at the noise of music, especially a pair of bag-pipes." Later on he says: "This Malady has been removed, like the Biting of a Tarantula, with the sound of a musical instrument."

I could say much on tarantism, but Professor Sigerist has recently dealt with it in masterly fashion.[36] That will be my excuse for passing on to other things.

The Physiological Action of Music.

In the *Advancement of Learning* Francis Bacon wrote: "But to the purpose: this variable composition of man's body hath made it as an Instrument easy to distemper; and therefore the Poets did well to conjoin *Music* and *Medicine* in *Apollo*: because the Office of Medicine is but to tune this curious Harp of man's body and to reduce it to Harmony."

To *our* purpose then. Let us see what the age of science had to contribute to the tuning of the curious harp of man's body by music.

One of the earliest reflections on the actual effect of music on the body dates from 1668. It is found in the work of Senguerdius already quoted. His theory is that the air which is set in motion, in this way endows the adjacent air with a similar motion, and that by a similar motion moves the air which is farther away. In this way the spirits in the body to which the air is driven are affected. It is just what happens when one person yawns—another begins to yawn too! (*unde etiam sit ut oscitante uno alter oscitare incipiat*).[37] Curiously reminiscent of the modern theories of sound! A somewhat similar theory was put forward in 1729 by Richard Browne: swift and bold vibrations from a fiddle please the mind, and by sympathy "invigorate the whole machine. On the contrary, by soft, slow languishing strokes of the fiddle, the nerves will be so finely and delicately touched, and the sensation so ravished, as to cause the spirits to flow back in gentle modulations."[38] I may pass over without comment the experiments on a child under two years of age

[36] Sigerist, H. E.: *Civilization and Disease*. Ithaca, N. Y., 1944, 212 ff.
[37] Senguerdius, *op. cit.* (34), p. 46.
[38] Browne, R.: *Medicina Musica*. London, 1729.

which Richard Brocklesby recorded in 1749.[39] About the opening of the nineteenth century Grétry showed that the rate of his own pulse varied according to the tempo of the air which he sang.[40] In 1811 Desessarts made certain speculations on the action of music which are too long to quote and too diffuse to be of real value.[41] The theory of the "tone ether" seems to have been first mentioned by Hansen [42] in 1833, but it was developed more fully—and possibly independently—by Chomet [43] in 1874. The tone ether—Chomet's *fluide sonore*—fills all space like the other ether, and human beings, and to some extent inanimate objects too, could be influenced by it. When music is produced, it affects this tone ether for good or evil. Less highly developed was the theory of Esquirol which postulated the setting up by the music of nervous vibrations in the body. Somewhat analogous was the theory of Rambosson (1877) that there are three types of music: first, that which acts especially on the intelligence and the motor nerves; second, that which acts specially on the nerves of sensibility and the sentiments; and third, that which acts at the same time on the intelligence and the sentiments.[44]

In 1880 Dogiel carried out a series of experiments on men and animals, and he concluded that the effect of music was to cause sometimes a rise and sometimes a fall of blood pressure. He thought the effect was produced through the auditory nerve and the medulla oblongata. There is generally an increase in the heart rate, and this is frequently accompanied by respiratory changes. Variations in the blood pressure depend upon the pitch and loudness of the sound and on the tone colour, but individual idiosyncrasies have their effect. The effects are enhanced by strychnine, and diminished by curare, chloral hydrate, ethyl alcohol and morphia.[45]

[39] Brocklesby, R.: *Reflections on Antient and Modern Music with the application to the cure of diseases.* London, 1749.

[40] Grétry, R.: *Mémoire ou essai sur la musique.* Paris, 1789, p. 53 ff.

[41] Desessarts: *Réflexions sur la musique considérée comme moyen curatif.* Paris, 1811. (Printed by Baudouin.)

[42] Hansen, J. N.: *De musicae in corpus humanum vi*, Berlin, 1833: see p. 35 ff.

[43] Chomet, H.: *Effets et influence de la musique sur la santé et sur la maladie.* Paris, 1874, p. 135 ff.

[44] Quoted by Harford, *Lancet*, 1891, ii, 1068.

[45] *Lancet*, 1880, ii, 707.

In the same year (1880) Herbert Lilley [44] recommended music for certain types of mental patients, and he bolstered up his method by some highly imaginary reflections on its action by stimulation of the vasoinhibitory nerves, or alternatively by paralysis of the vasomotor nerves. In 1887 Lombard [46] noticed that music caused reinforcement of the knee jerks; the reinforcement was enhanced as the music approached, and vice versa.

Wimmer [47] published in 1889 the results of experiments carried out on 1400 insane women in an asylum. A piano was played to them for half-an-hour. All responded to the rhythm of the music, and in some cases the pulse rose. Slow music soothed and sometimes sent to sleep. In almost every instance the effects of the pronounced rhythm were involuntary, the movements of the limbs and facial muscles being attributed to reflex action.

The experiments which Tarchanoff [48] carried out in 1894 with Bogouslavsky and Wartanoff are interesting. They used a Mosso ergograph to assess the effect of music on the neuro-muscular system of man. A weight of 2.5 kgm. was attached to a finger, and contractions were made, either voluntarily or induced by electric stimulation of the median nerve, at two second intervals. Muscular fatigue is reduced by the use of music. They also showed that a slow melody will weaken muscular contractions, and cause these to disappear when they are already weak. There is an analogy between muscular contraction and heart action under the influence of music. Tarchanoff attributes these results to the effect of depressive nerve fibres to the various muscles. As a third string he puts forward the theory that sounds, acting on the organism, must also exercise some influence on the intensity of oxidation of the tissues. With his colleagues he did some animal experiments on this point. Tarchanoff concludes that there is a physiological basis for the use of music in certain diseases.

In the closing years of the nineteenth century Patrizi [49] had as a

[46] Lombard, quoted by E. Podolsky, *Canad. Med. Ass. Journ.*, 1934, xxx, 195-200.
[47] Wimmer, S. J.: *N. Y. Med. Journ.*, 1889, ii, 258-260.
[48] Tarchanoff: *Atti dell' XI Congresso Med. Internat., Roma*, 1894. Vol. ii, 153-157.
[49] Patrizi, M. L.: *La nova fisiologia della emozione musicale*. Torino, 1903.

patient a boy with a wound in the skull. The brain was exposed, and Patrizi was able to measure the effect of music on the cerebral circulation. There appeared to be an actual increase in the size of the brain, and different modes of music seemed to produce different effects on the cerebral circulation. In 1895 Binet and Courtier [50] carried out experiments on a musician. They found that the heart's action especially, but also the respiration, were quickened by isolated chords. When an emotional element was introduced by playing a melody the effect was greater. They also studied the influence of music on the capillary circulation. In 1900 Dixon [51] confirmed the work of Dogiel, and carried out experiments himself on mental patients. He found that even with the softest music there was a rise of blood pressure, and that heart and respiration were accelerated. These effects were much increased when the music happens to be a martial melody.

The last physiological experiments which I shall quote are those carried out in 1918 by Hyde and Scalapino [52] at Kansas. They used the electrocardiogram to study the effect of music on the circulation, but the observations—on three patients only—were not sufficiently numerous and varied to give definite results.

So much has been written from a non-scientific aspect on the effect of music on digestion that I dare not embark on this subject here. Caterers and restaurant proprietors do not appear to be in much doubt. I would merely remind you that Sydney Smith once said that his idea of heaven was eating *foie gras* to the sound of trumpets!

Musical Symbols in Physiology and Medicine.

Little has been written on this subject and I should like to mention the work of a man who had some influence in his time.

François Nicolas Marquet [53] (Fig. 4) was born at Nancy in 1687. He studied medicine at Pont-à-Mousson and at Montpellier.

[50] Binet, A. and Courtier, J.: *L'Année Psychol.*, 1895, ii, 87-167.
[51] Dixon, J. H.: *Med. Mag.*, 1900, ix, 290-300.
[52] Hyde, I. H. and Scalapino, W.: *Amer. J. Physiol.*, 1918, xlvi, 35-38.
[53] The biographical notes on Marquet are taken from the *éloge* in the 1769 edition of his book.

Fig. 4.

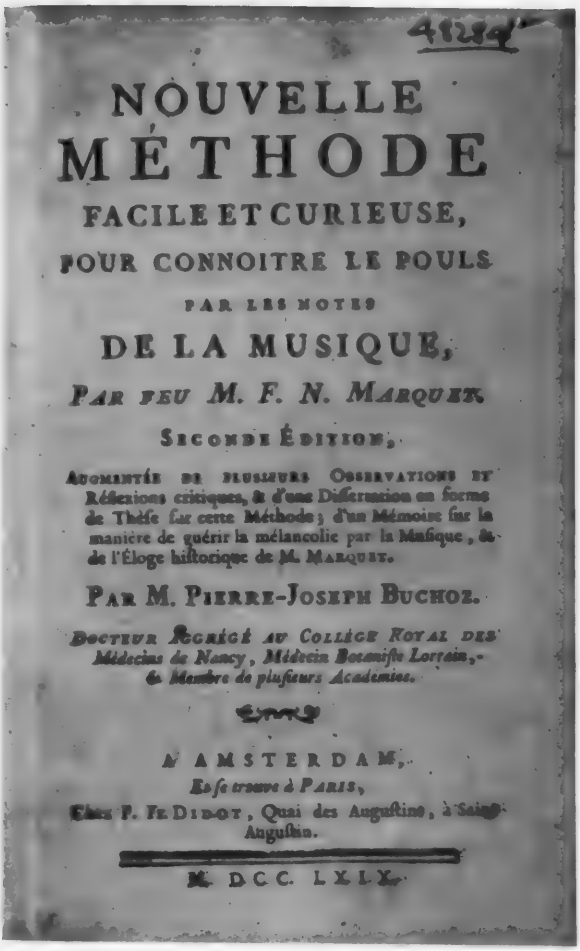
François Nicolas Marquet (1687-1759). Engraved by Nicole at Nancy, 1763.
(Impression in the Wellcome Historical Medical Museum, London.)

He finally returned to Nancy, where he had a distinguished practice, and where also he became very well known for his botanical work. During 35 years he explored every corner of Lorraine in search of plants, and he published a Dictionary of these plants in three folio volumes. In 1747 he published the first edition of the work on the pulse to which I refer here, and in 1750 his *Observations sur la guérison de plusieurs maladies notables aiguës et chroniques*. Two years later marked the foundation of the Collège Royale des Médecins de Nancy, and he was made the first Doyen. Marquet died on 28th May, 1759.

His book on the pulse was republished in a second edition in 1769. It has as title: *Nouvelle Méthode facile et curieuse pour connoître le pouls par les notes de la musique*. (Fig. 5) In his preface he points out that as soon as the motion of the heart is deranged by some accident, health is affected by an infinite number of diseases. Avicenna, Savonarola, Fernel and others, he says, had proposed a study of the pulse, but he was the first to put it into practice.

Marquet describes twelve different types of pulse: the natural; the 'pouls grand'; the 'pouls petit'; the profound; the superficial; the rapid; the very rapid; the precipitous; the slow; the intermittent; the unequal; the convulsive. His pulse diagram consists of two horizontal lines, which are divided into 'bars' by vertical lines at equal intervals. Each bar is divided into five subdivisions by finer vertical lines. A regular pulse is indicated by a note placed in the first subdivision after each bar line. Irregularity of the pulse is indicated by placing the notes in other subdivisions. Then, the note may be placed in five different positions with reference to the horizontal lines. The five vertical positions in order are: under the lower line (concentrated pulse); on the lower line ('pouls profond'); between the two lines (natural pulse); on the upper line ('pouls élevé'); above the upper line (superficial pulse). Finally, a crotchet indicates a natural pulse; a minim, a 'pouls grand'; a quaver, a 'pouls petit'; and a semiquaver, a thready pulse. Some of these types are reproduced from his illustrations as Figs. 6-8.

Although the whole system may now seem highly artificial and unnecessary, if we judge from the testimonials which are appended to the second edition, the student and physician of Marquet's day must have found it helpful.



41284

NOUVELLE
MÉTHODE
FACILE ET CURIEUSE,
POUR CONNOITRE LE POULS
PAR LES NOTES
DE LA MUSIQUE,
PAR FEU M. F. N. MARQUET.
SECONDE ÉDITION,
AUGMENTÉE DE PLUSIEURS OBSERVATIONS ET Réflexions critiques, & d'une Dissertation en forme de Thèse sur cette Méthode; d'un Mémoire sur la manière de guérir la mélancolie par la Musique, & de l'Éloge historique de M. MARQUET.
PAR M. PIERRE-JOSEPH BUCHOZ.
DOCTEUR AGRÉGÉ AU COLLÈGE ROYAL DES Médecins de Nancy, Médecin Botaniste Lorrain, & Membre de plusieurs Academies.
A AMSTERDAM,
Et se trouve à PARIS,
Chez P. FR. DIDOT, Quai des Augustins, à Saint Augustin.
M. DCC. LXIX.

Fig. 5.

Title-page of Marquet's *Nouvelle Méthode*, Second edition, 1769.

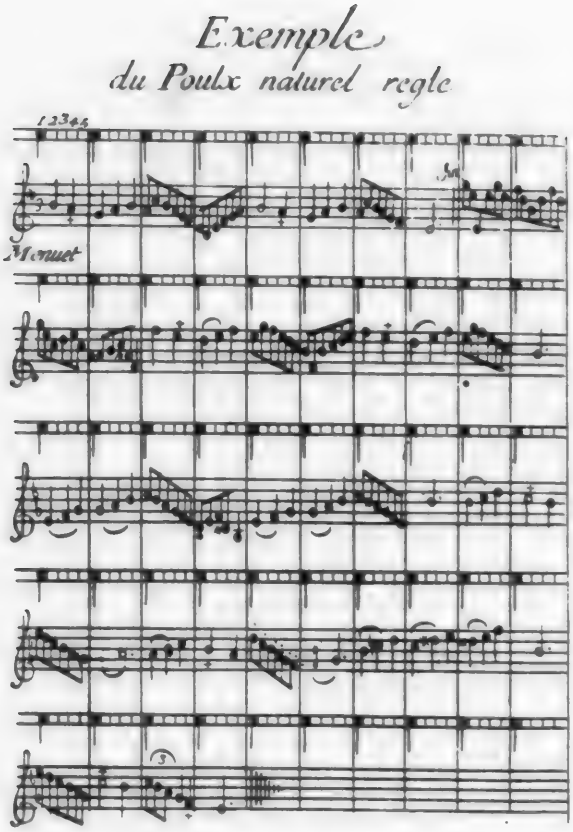
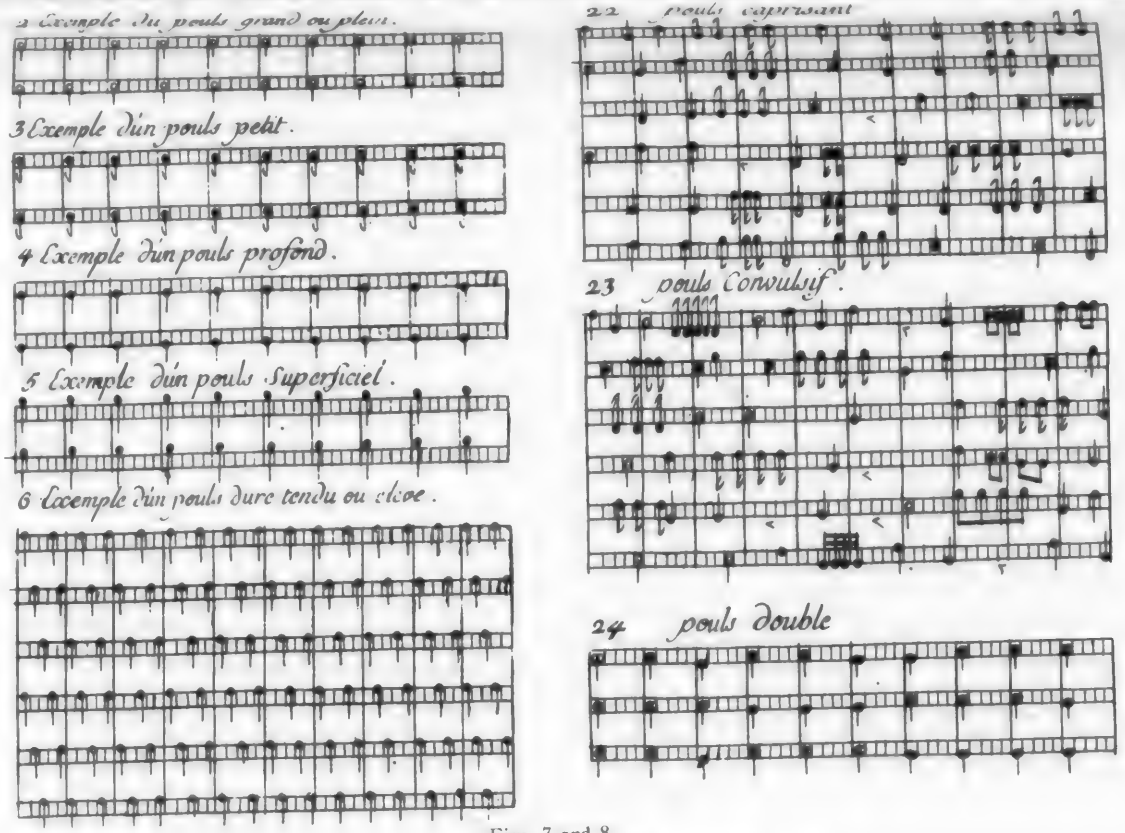


Fig. 6.

Marquet's diagram for the regular natural pulse.


2 Exemple du pouls grand ou plein.
3 Exemple d'un pouls petit.
4 Exemple d'un pouls profond.
5 Exemple d'un pouls superficiel.
6 Exemple d'un pouls dure tendu ou eleve.
22 pouls capricant
23 pouls Convulsif.
24 pouls double

Figs. 7 and 8.

Marquet's diagrams showing various types of abnormal pulses.

Music Therapy in the Modern Period.

It must be said that, apart from any advances which have been made in the last 50 years, and which lie outside the scope of this discourse, music therapy lagged much behind our knowledge of the effects of music. There are the usual anecdotes of distinguished persons, such as Philip V of Spain and George III; but one swallow does not make a summer.

Baglivi is disappointing. In dealing with diseases of the mind, he includes music with frequent bathing, suitable diet, exercise, foreign travel, and dancing, "all which, by virtue of the soft and gentle Delights they give to the Mind, do gradually repair the sickly Constitution of the Body, and reduce the disorderly Motions of the Imagination to their Primitive Regularity." [54]

In 1707 Dodart [55] reported to the Académie Royale des Sciences the case of a well-known composer who fell into a delirium. On the third day he asked for a concert, and the cantatas of Bernier were sung to him. Ten days of this treatment cured him. Dodart does not claim that the case should be used as an example. The report ends with a denial of the possibility of a painter being cured by an exhibition of pictures.

In 1708 there was reported, also to the Académie Royale, a case in which M. de Mandajor, the mayor of Alais in Languedoc, was concerned.[56] The patient was a dancing master, who fell sick of a fever, accompanied by a lethargy. This was followed by a prolonged delirium. All remedies were unsuccessful. At last M. de Mandajor persuaded the doctor to have played to the patient some of these melodies which he knew so well. The treatment was now successful, and sleep was followed by recovery.

In 1790 James Lucas, a surgeon at Leeds, described a curious case of a youth of 20 years, who had a slow fever.[57] He was roused by music, and Lucas describes his curious antics. However, convulsive

[54] Baglivi, G.: *The Practice of Physick. . . .* London, 1704, p. 184.

[55] Dodart, in "Diverses observations de physique générale," *Hist. de l'Acad. Roy. des Sciences, Année MDCCVII.* Paris, 1730, pp. 7-8.

[56] *Ibid.*, for the year 1708. Paris, 1730, p. 22.

[57] Lucas, J.: *Lond. Med. Journ.*, 1790, xi, 125-130.

fits followed later, and the youth died nine months from the start of the illness. Lucas denies that the illness was St. Vitus' dance. Although the Tarantella had a marked effect, Lucas also denies that the youth had been bitten by any insect.

In the paper by Desessarts (1811) which I have already mentioned,[57a] the author gives four reasons why the textbooks of the time do not recommend music as a method of treatment: (1) emphasis tends to be placed on infallible and specific remedies; (2) the haste of the assistants, who tend to discard a remedy at once if it is not successful; (3) a doctor who recommends music tends to be ridiculed; (4) lack of judgment in not choosing suitable types of music. This paper is, incidentally, one of the earliest to attempt to describe how music functions in the cure of disease.

In 1896 Beschinsky [58] treated a child suffering from sleeplessness with the music of Chopin, played by the mother.

One of the pioneers of the use of music in mental hospitals was Hayes Newington, and in view of the importance of this work today, some attention will be paid to his achievements. Herbert Francis Hayes Newington was born at Ticehurst, East Sussex, in 1840. He was educated at University College, London, from which he became M. R. C. S. Eng. in 1871. He then studied at Edinburgh, where he took the L. R. C. P., and was later elected a fellow. For some time he was an assistant physician at the Royal Edinburgh Asylum, and he then became a joint proprietor of the Ticehurst Asylum, where he remained during the rest of his life. He was treasurer, and later president, of the Medico-Psychological Association of Great Britain and Ireland, and he took a prominent part in the local affairs of East Sussex, of which county council he was an alderman. He married in 1875 a daughter of Professor Archer, the director of the Edinburgh Museum of Arts and Science, and he had two children. He died at Ticehurst on 31 July, 1917.[59]

In 1897 Hayes Newington published a long article on the mental aspects of music.[60] He himself played the church organ in his

[57a] See footnote 41, *supra*.
[58] Beschinsky, quoted by J. H. Dixon, footnote 51.
[59] Hayes Newington: Obit. *Lancet*, 1917, ii, 214.
[60] Newington, H. H.: *Journ. Ment. Sci.*, 1897, xliii, 704-723.

asylum, and the article dealt partly with his observations on patients. He says that music stands alone in its power to throw a multiplicity of diverse but intermingled stimuli at the same moment on the brain, with a corresponding mass of percepts, concepts, and resulting kinaesthetic activity. He concludes that much reflex action is involved in the playing of an instrument. In relation to this he described the case of a demented lady who was a skilled pianist. If a duet was placed in front of her, she played first the left hand part, and then followed it with the right hand part. He considered that this negatived the slightest co-operation of thought. Newington then discussed his own reactions when he was accompanying his choir while suffering from an attack of gout. His own co-ordination was upset, and he was pained by want of time and tune in others. He thought that the independence of sense gratification and intellectual satisfaction partly explains the marked pleasure which many idiots and others of low intellectual development evince in listening to music. The idiot retains his pleasure sense more or less, and music is one, and a ready, means of gratification. He then discussed the effects of rhythm in music. Newington's importance was not so much in what appears in this paper, as in the fact that it was well known that he was interested in this field; his work was a stimulus to others.

Newington's work was continued by Dixon,[60a] who noted that individuals react differently to the same music, and he thought that this factor should be utilised in treatment. He concludes that there are two kinds of patients. The first show slow circulation and an ill-nourished brain. The music used to treat these should be bright and cheerful in character. In the second type the blood pressure is high and the pulse rapid: there is often delirium. These features occur in fevers, alcoholic mania, night tremors, petit mal, and chorea. The music used for such cases should be soft and of a soothing character. It should be remembered that Dixon's observations were made mostly on mental patients.

[60a] See footnote 51, *supra*.

The Guild of St. Cecilia.

So far we have heard of nothing in the realm of treatment which could be regarded as in any way original. In the closing years of the nineteenth century, however, there was born a movement which had the benefit of one guiding hand. In its brief life it foreshadowed some of the developments which have meant much both to music and to medicine during the last twenty-five years. I shall close this discourse with a brief account of the Guild of St. Cecilia.

Frederick Kill Harford was born in 1832, the second son of Henry Charles Harford of Clifton, Bristol. He was educated at Rugby, and in 1850 he entered New Inn Hall at Oxford. He took his B. A. in 1855 and his M. A. in 1858. In 1861 he was appointed a minor canon at Westminster, and from 1865 until his death in 1906, at the age of 74, he resided in one of the Abbey's houses in Dean's Yard. He was by nature an artist, and he had considerable ability as a designer of medallions. He met Gustave Doré at the Paris exhibition of 1867, and the two remained on very intimate terms. Doré owed much to Harford's advice. I would like to emphasise that Harford was an Associate of the Royal Academy of Music, and his status was therefore equivalent to that of a professional musician.[61]

In the *Lancet* for 1891 there appeared, within the space of four weeks, three editorials devoted to the subject of music as a remedy. They were published on April 25th, May 9th and May 23rd. No opinions of any great value are found in these editorials.

On July 4th, 1891, the *Lancet* contained a letter signed by Frederick K. Harford, and headed "Music in Illness." In this letter Canon Harford asked for the opinion of the leading men in the medical world "whether soft low music might not be used with advantage as a curative assistant in a considerable number of cases of illness, more particularly those in which the nerves are specially concerned?" He goes on to say that five years before he had tried the method with success in the case of a lady of 86 years. He offers

[61] For Harford's biography, see the *Rugby School Register*; Foster's *Alumni Oxoniensis*; Alice Harford, *Annals of the Harford Family*. London, 1909, pp. 34-5; B. Jerrold, *Life of Gustave Doré*, London, 1891, pp. 275-6.

to have the experiment repeated with the same players. He states that he had seen the editorials of April 25th and May 23rd for the first time on the day of writing. (He had evidently not seen the editorial of May 9th.) Harford then puts forward in outline a complete scheme—in the form in which it very soon took shape. This passage is worth quoting. He says:

> If it be assumed that the opinions put forward in these articles are in the main correct, and that music possesses the virtue here attributed to it, the question arises: how can we apply it so as to become of practical value to a large number of the community? The answer to this is clear enough. Let a large number of lady vocalists and violinists (of either sex) be enrolled who would be content to be formed into a regular society under a governing body or council. Let there be in all great cities of the kingdom centres or habitations, say twenty in our enormous metropolis, and six, four or two in the provincial towns according to their size and population. Over each of these centres there should be a paid official—viz. a lady directress—who would be in communication with ten or twelve vocalists and half that number of violinists. A message sent from a physician to a directress would summon three of the aforementioned musicians to be at a given place at a given time, and they might be on the spot after a few hours at the most, when all things are in working order. Certain rules ought to be strictly observed—viz. that the music be played in a room adjoining that of the patient and not in the sick room; that the patient be never, on any pretext whatever, seen or spoken to, since all suspicion of 'visiting' must be kept apart from this mission of music. The violins should always be muted, the musicians should be always unseen, and their names unknown. . . . The artists . . . as well as the lady directresses . . . must . . . be paid for their services, and double fees should be allowed for music played between 12 p. m. and 7 a. m. . . .

In a postscript he refers to the project as the Mission of St. Cecilia, and says that Miss Florence Nightingale has already given her support. A short editorial note is very reserved.

The Magazine of Music, in its issue for August, 1891, reprinted the whole of this *Lancet* letter without comment.[62] This letter was seen by a Mr. E. M. Webb—presumably the Vicar of St. John's, Worcester—and he wrote to Harford saying that for three years music "had an enormous influence over [him], being a means of restoring consciousness in a peculiar kind of fit to which [he] was once subject." Harford himself sent a copy of this letter to the

[62] Harford, F. K.: *Mag. of Music*, 1891, viii, 159.

Lancet, in which journal it was published on Aug. 29th. From a letter from Harford in the *British Medical Journal* of Sept. 5th it is evident that by that date the Guild of St. Cecilia had been formed, and had been able to issue a prospectus. To this prospectus the *British Medical Journal* referred in an editorial a week later. It made it clear that one object of the Guild was to collect useful data. In addition this significant objective had now been added: "To hire or build in a central part of London a large hall in which music shall be given throughout all hours of the day and night. *This music to be conveyed by telephone attached to certain wards in each of the chief London hospitals.*" (Italics not in original.) Here, in effect, is the idea of broadcasting and the use of earphones in hospitals.

In each of the two succeeding numbers of the *British Medical Journal* (Sept. 19th and 26th) Harford had a letter. He defines the results desired as (*a*) contentment; (*b*) alleviation of physical pain in certain illnesses; and (*c*) the induction of sleep. They employ singers, a harp, and muted violins. A rehearsal of the St. Cecilia Choir took place in Room 4 of the Westminster Palace Hotel on Sept. 21st, and so many persons were present that 30 or 40 had to be turned away. For the next rehearsal Room 1, seating 500 persons, had been reserved. Harford also reports experimental visits to the Temperance Hospital and to the St. Pancras Infirmary.

Five days later the music journals entered the field. The *Musical Opinion* of Oct. 1st contained a note which was critical of the telephone scheme. It is evident that the writer did not really understand Canon Harford's ideas. On the same day the editor of the *Musical Times* honoured Canon Harford by devoting a long editorial to the scheme. I suspect that the editor thought that Harford and his Guild formed an excellent target for barbed shafts. "Doubtless," he says, "we shall come in time to have electric call-boxes provided with a special signal for summoning the medical musician, so that within a very few minutes of the first symptoms of influenza, or mumps making their appearance we shall be able to nip the ravages of these maladies in the bud by application of the proper musical remedies." The editor ends up with the statement that only the fact that Florence Nightingale is a patroness redeems the scheme from ridicule.

The *Musical Standard* of Oct. 3rd gave the names of some of those who had been present at the recent rehearsals, and of the 74 persons who were mentioned, 20 were medical men. An editorial in the following number was quite sympathetic.

From letters which Harford wrote to the *British Medical Journal* during October it is obvious that he was anxious to meet criticism and to collect data in a scientific fashion. If he had been more of a scientist he would have realised that it is not desirable to conduct experiments of this type at a time when they are liable to be upset by chiming clocks or factory hooters. During the same month Dr. Edwin Goodall [63] of Manchester wrote a plea for a trial of the method in asylums. Goodall starts off by remarking facetiously that the average lunatic would cheerfully discard paraldehyde in favour of a lullaby, but he does not think that in them music would induce sleep. But in other directions he thinks that the effects of music on the insane could be observed with advantage. He wonders whether music could not be combined with suggestion in the case of refractory maniacs. At all events, music might be tried before chloroform or restraining. He believes that it would be interesting to see the effects of music on a patient who maintains an obstinate silence. The stuporose and cataleptic patient is well suited for musical experiment. Finally, Goodall believes that the St. Cecilia Guild had a field in asylums.

The records are now silent for a period of nearly a year. In Sept. 1892 London was suffering from a bad epidemic of scarlet fever, and the irrepressible Canon pleaded for the use of music, as administered by the Guild, as a therapeutic agent.[64] This gave the *Musical Times* the opportunity to retort that if any members of the Guild themselves fell victims, their loss would be by no means irreparable.[65]

The journals about this period contain reports of the work of others—such as Ewing Hunter and Blackman—who perhaps, out of enthusiasm and zeal, did not understand the limitations of the method.[66]

[63] Goodall, E.: *Brit. Med. Journ.* 1891, Oct. 24, ii, 920.
[64] Harford, F. K.: *ibid.*, 1892, ii, 665-6.
[65] *Musical Times*, 1892, Oct. 1.
[66] Hunter, J. E.: *Brit. Med. Journ.* 1892, ii, 923; also editorial. *Ibid.* 1893, i, 216.

The last years of the Guild are shrouded in mystery. *Punch* had a skit on the healing power of music in June, 1895. The last reference which I have been able to find to the activities of the Guild is contained in an editorial in the *British Medical Journal* of March 14, 1896. The opening sentences are as follows: "On several occasions we have referred to the efforts of the Rev. F. K. Harford and others to bring music within the sphere of practical therapeutics. The St. Cecilia Guild—excellent as its intentions were—worked somewhat fitfully and aimed too high." This is the epitaph of Canon Harford's valiant attempt. Not, perhaps, too high—but before its time.

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WHAT IS SOCIAL MEDICINE?

A Genetic Analysis of the Concept

GEORGE ROSEN

I.

Introduction

Disease is a biological process which is older than man. It is as old as life itself, for it is an attribute of life. A living organism is a labile entity in a world of flux and change, and health and disease are linked aspects of this all-pervading instability. Health and disease are expressions of changing relationships between the various components of the body, and between the body and the external environment in which it has its being. As a biological phenomenon, the causes of disease are sought in the realm of nature; but in man disease has still another dimension. Nowhere does human disease occur as "pure nature"; instead it is ever mediated and modified by social activity and the cultural environment which such activity creates.

These general conceptions are not new, and in earlier periods medical practitioners were aware of them in an empirical way. The practice of medicine has always been linked with the social and economic conditions of particular groups of people, but these relations were only rarely made the subject of theoretical discussion. Not until modern times does there appear a clear awareness that intimate bonds link social conditions and medical problems. The need for consideration of social viewpoints in dealing with problems of medicine and hygiene was recognized by various medical men during the eighteenth century. Probably best known in this connection are Bernardino Ramazzini and Johann Peter Frank. It was left for the nineteenth century, however, to develop the idea of medicine as a social science, and eventually to formulate with greater precision and clarity the concept of social medicine.

II.

Medicine—A Social Science. The Idea of 1848

In 1893, in an essay dealing with the etiological therapy of infectious diseases, Emil Behring noted as characteristic of the medical thought of the earlier nineteenth century the association in a causal relationship of social misery and disease.[1] For specific illustration of this point, he referred to Rudolf Virchow's report on the epidemic of typhus fever in 1847 in Upper Silesia. Virchow conceived of this outbreak as due to a complex of social and economic factors, and consequently expected little from any medicinal therapy. Instead, he proposed thoroughgoing social reform, which in most general terms comprised " complete and unrestricted democracy," education, freedom and prosperity. Behring passes over this with the condemnation of faint praise, remarking that while these views also had their merits, now, following the procedure of Robert Koch, the study of infectious diseases could be pursued unswervingly without being sidetracked by social considerations and reflections on social policy.[2]

What is the meaning of this profound cleavage that separates Behring and Virchow? For an answer to this question, an analysis of Virchow's conception of the nature of medicine offers a point of departure. Basic to such an analysis is the circumstance that his views originated and found explicit expression as an integral part of his activity during the revolutionary movement of 1848.[2a]

On May 1, 1848 in a letter to his father Virchow tried to explain

[1] E. Behring: *Gesammelte Abhandlungen zur ätiologischen Therapie von ansteckenden Krankheiten*, Leipzig, Georg Thieme, 1893, p. xvii (Der Beginn der socialen Aera aber macht sich in unserem Jahrhundert bemerkbar in der Zurückführung der Krankheiten auf das sociale Elend), and p. xix (Hier finden wir die Anschauungen in voller Schärfe, welche noch lange Zeit einer naturwissenschaftlichen Betrachtungsweise der Krankheitsätiologie entgegenstanden: die Zurückführung der epidemischen Krankheiten auf das *sociale Elend*).

[2] *Ibid.*, p. xix.

[2a] For an excellent analysis of the German medical reform movement of 1848 and of Virchow in relation to this movement consult the monograph of Erwin H. Ackerknecht: Beiträge zur Geschichte der Medizinalreform von 1848, *Sudhoff's Archiv für Geschichte der Medizin* 25: 61-109, 112-183.

his fundamental point of view. "I have often been deceived in people," he wrote, "but not yet in the age. As a result, I now have the advantage that I am no longer a partial man, but a whole one, and that my medical creed merges with my political and social creed."[3] That Virchow practiced what he preached is clear from his actions. The March Days in Berlin had followed hard on the heels of the victorious February Revolution in Paris. On March 18, the people of Berlin rose in revolt and threw up barricades. Among the defenders of the barricade that blocked the Friedrichstrasse from the Taubenstrasse was Rudolf Virchow.[4] Not quite four months later, on July 10, 1848 appeared the first number of the weekly, *Die medicinische Reform*, edited jointly by Virchow and R. Leubuscher. In the challenging programmatic editorial with which he launched the journal, Virchow showed that the change from the musket to the pen had in no way altered his fundamental position. He said:

> The "Medical Reform" comes into being at a time when the overthrow of our old political institutions is not yet completed, but when from all sides plans are being laid and steps taken toward a new political structure. What other task could then be more natural for it to undertake, than that of participation in clearing away the old ruins and in constructing new institutions? Severe and mighty political storms such as now roar over the thinking portion of Europe, shaking to the foundation all elements of the state, indicate radical changes in the prevailing conceptions of life. In this situation medicine cannot alone remain untouched; it too can no longer postpone a radical reform in its field.[5]

This awareness of the relations of medicine to social problems, Virchow formulated in the somewhat rhetorical but striking slogan: "Medicine is a social science, and politics nothing but medicine on a grand scale."

The idea of medicine as a social science did not originate with Virchow. Industrialization and its attendant social problems led various investigators to study the influence of such factors as poverty

[3] Rudolf Virchow: *Briefe an seine Eltern 1839 bis 1864*, herausgegeben von Marie Rabl geb. Virchow, Leipzig, Wilhelm Engelmann, 1907, pp. 144-145.

[4] *Ibid.*, p. 135.

[5] *Die medicinische Reform. Eine Wochenschrift, erschienen vom 10. Juli 1848 bis zum 29. Juni 1849*, Berlin, Druck und Verlag von G. Reimer, No. 1, p. 1.

and occupation on the state of health. This was particularly true in France where during the 'thirties and 'forties medical men such as Villermé, Benoiston de Chateauneuf, and Guépin, and social theorists like Constantin Pecqueur dealt with socio-medical questions. Arnold Ruge, a democratic German journalist, wrote in 1844 that "Every attempt to make science serviceable to the world, every association of science with politics is directly linked to France." [6] This judgment may be taken as applying also to ideas on the social relations of medicine. From Paris, the fountainhead of advanced thought, liberal ideas spread to Germany. The publication in 1842 of Lorenz Stein's book, *Der Socialismus und Kommunismus des heutigen Frankreich; Ein Beitrag zur Zeitgeschichte*, made a profound impression on the German public.[7] Virchow's contact with these intellectual currents is indicated by the quotation, in a letter of 1843 to his father, of a passage from Ruge's *Deutsche Jahrbücher*, which had been suppressed by the Prussian government.[8] Other German physicians shared Virchow's point of view, and during 1848 joined forces with him to secure long overdue medical reforms. Prominent in this group were Salomon Neumann and Leubuscher, Virchow's editorial associate. In his book, *Die öffentliche Gesundheitspflege und das Eigenthum*, published in 1847, Neumann had vigorously asserted the view that "medical science is intrinsically and essentially a *social* science, and as long as this is not recognized in practice we shall not be able to enjoy its benefits and shall have to be satisfied with an empty shell and a sham." [9] And in 1851, in a study of the medical statistics of the Prussian state, Neumann again stressed the importance of this idea.[10] The same point of view was

[6] Arnold Ruge: Plan der Deutsch-Französischen Jahrbücher, *Deutsch-Französische Jahrbücher*, herausgegeben von Arnold Ruge und Karl Marx, Paris, 1844, p. 6. [Reproduced in facsimile in the series *Neudrucke marxistischer Seltenheiten* (I) Verlag von Rudolf Liebing (L. Franz & Co.), Leipzig, 1925.]

[7] Lorenz von Stein: *Geschichte der sozialen Bewegung in Frankreich von 1789 bis auf unsere Tage* (3 vols.). München, Drei Masken Verlag, 1921, vol. I, pp. vii-viii.

[8] Virchow, *Briefe*, p. 52.

[9] S. Neumann: *Die öffentliche Gesundheitspflege und das Eigenthum. Kritisches und Positives mit Bezug auf die preussische Medizinalverfassungs-Frage*, Berlin, Adolph Riess, 1847, pp. 64-65.

[10] S. Neumann: Zur medizinischen Statistik des preussischen Staates nach den

expressed by Leubuscher in the statement that " medicine is a purely social science "; [11] but he went on to point out that the idea still lacked any practical content.[12]

Nevertheless, it is clear from contemporary discussions that the proponents of this idea were not dreaming of some medical Cloud-cuckooland, but employed it rather as a convenient formulation under which to sum up definite principles. The *first* of these is that *the health of the people is a matter of direct social concern.* Society has an obligation to protect and insure the health of its members. According to Neumann,

> It is the duty of society, i. e., of the state, as a fundamental condition for all enjoyment and activity, to protect, and when endangered to save, the lives and health of the citizens. If it is the duty of social man to combat and to help endure the dangers which develop precisely because of social life, then it is equally clear that the state is obliged to combat and where possible to destroy not only natural dangers, but as well those dangers to human life.[13]

Virchow derived the same point as a logical consequence of democratic principles.

> The democratic state [he declared] desires that all its citizens enjoy a state of well-being, for it recognizes that they all have equal rights. Since general equality of rights leads to self-government, the state also has the right to hope that everyone will know how through his own labor to achieve and to maintain a state of well-being within the limits of the laws set up by the people themselves. However, the conditions of well-being are health and education, so that it is the task of the state to provide on the broadest possible basis the means for maintaining and promoting health and education through public action. . . . Thus it is not enough for the state to guarantee every citizen the basic necessities for existence, and to assist everyone whose labor does not suffice for him to acquire these necessities; the state must do more, it must assist everyone so far that he will have the conditions necessary for a healthy existence.[14]

The *second* principle involved in the idea of medicine as a social science is that *social and economic conditions have an important effect*

Acten des statistischen Bureau's für das Jahr 1846, *Archiv für pathologische Anatomie und Physiologie und für klinische Medicin*, 3: 13-141, 1851 (see page 19).

[11] R. Leubuscher: Zur Reform der Sanitätspolizei, *Medicinische Reform*, p. 11.

[12] *Ibid.*, p. 11.

[13] Neumann: *Öffentliche Gesundheitspflege*, p. 64.

[14] Rudolf Virchow: Die öffentliche Gesundheitspflege, *Medicinische Reform*, No. 5. August 4, 1848, pp. 21-22.

on health and disease, and that these relations must be subjected to scientific investigation. For Neumann no proof was necessary to show that "the greatest number of diseases which either prevent the complete enjoyment of life or kill a considerable number of people prematurely are due not to natural causes, but rather to artificially produced social conditions." [15] He was convinced that poverty, hunger, and misery "if not identical with death, disease and chronic suffering were nevertheless, like their inseparable companions, prejudice, ignorance, and stupidity, the inexhaustible sources from which the former originate." [16]

Virchow's basic standpoint was very similar, but in expressing it his emphasis differed from that of Neumann. The investigation of the Silesian typhus epidemic of 1847 led Virchow to the conclusion that its causes were as much social, economic and political as they were biological and physical. This view he later generalized in a series of articles on *Public Health*, in which he discussed the relation of medical problems to social and political developments. "The very word 'Public Health,'" he declared, "shows those who were and still are of the opinion that medicine has nothing to do with politics the magnitude of their error." [17] Virchow conceived the scope of public health as broadly as possible, indicating that one of its major functions was to study the conditions under which various social groups lived, and to determine the effects of these conditions on their health. On the basis of this knowledge it would then be possible to take appropriate action. "For if medicine is really to accomplish its great task, it must intervene in political and social life. It must point out the hindrances that impede the normal functioning of vital processes, and effect their removal." [18]

As an extension of his views on the relations of medicine to society, Virchow developed a theory of epidemic disease as a manifestation of social and cultural maladjustment. Reasoning by analogy, he drew a parallel between the individual and the body

[15] Neumann: *Öffentliche Gesundheitspflege*, p. 64.
[16] Neumann: Zur medicinischen Statistik . . . p. 61 (see footnote 10).
[17] *Medicinische Reform*, p. 21.
[18] Rudolf Virchow: *Die Einheitsbestrebungen in der wissenschaftlichen Medicin*, Berlin, Druck und Verlag von G. Reimer, 1849, p. 48.

politic: "If disease is an expression of individual life under unfavorable conditions, then epidemics must be indicative of major disturbances of mass life."[19] These disturbances are social and economic in nature, e. g. business depressions, unemployment and the like. "Don't we see that epidemics everywhere point to deficiencies of society?" Virchow asked. "One may point to atmospheric conditions, general cosmic changes and the like, but in and of themselves these never cause epidemics. They always produce them only where, because of poor social circumstances people have lived for a long time under abnormal conditions."[20] Virchow differentiated *natural* and *artificial* epidemics, basing his distinction on the degree to which cultural factors interpose themselves between nature and man.

> Living conditions [he pointed out] are either natural or artificial depending on the spatial and temporal situation of the individual. The development of culture, by multiplying the relations of individuals to each other, also complicates living conditions. . . . Consequently epidemics are *natural* or *artificial* depending on whether the change in living conditions occurs of its own accord through natural events, or artificially, because of the mode of life.
>
> Natural epidemics have always been present whenever changes of season, of weather, etc. altered living conditions, and the great mass did not protect itself by artificial means. They recur as often as external conditions require, and remain as long as these last. Fluxes, intermittent fevers, and pneumonias have occurred epidemically at all times.
>
> Artificial epidemics, however, are attributes of society, products of a false culture, or of a culture which is not available to all classes. These are indicative of defects produced by political and social organization, and therefore affect predominantly those classes that do not participate in the advantages of the culture. Here belong typhus, scurvy, the sweating sickness, and tuberculosis.[21]

Furthermore, these "artificial" epidemics occur not only as a result of social contradictions, but also as significant manifestations of the historical process. Such outbreaks of disease occur at nodal points in history, during periods of political and intellectual revolu-

[19] *Ibid.*, p. 46.

[20] Rudolf Virchow: Die Epidemien von 1848. (Gelesen in der Jahressitzung der Gesellschaft für wissenschaftliche Medicin am 27. Novb. 1848.), *Archiv für pathologische Anatomie und Physiologie und für klinische Medicin*, 3: 3-12, 1851 (see page 10).

[21] Virchow: *Einheitsbestrebungen*, pp. 46-47.

tion. "History has shown more than once," Virchow declared in August, 1848, "how the fates of the greatest empires were decided by the health of their peoples or of their armies, and there is no longer any doubt that the history of epidemic diseases must form an inseparable part of the cultural history of mankind. Epidemics correspond to large signs of warning which tell the true statesman that a disturbance has occurred in the development of his people which even a policy of unconcern can no longer overlook." [22] And in 1849 Virchow carried this train of thought to its logical conclusion. "Epidemic diseases exhibiting an hitherto unknown character appear and disappear," he pointed out, "after new culture periods have begun often without leaving any trace. As cases in point take leprosy and the English sweat. The history of artificial epidemics is therefore the history of disturbances which the culture of mankind has experienced. Its changes show us with powerful strokes the turning points at which culture moves off in new directions. Every true cultural revolution is followed by epidemics, because a large part of the people only gradually enter into the new cultural movement and begin to enjoy its blessings." [23] Finally, attention must be drawn to the fact that in his socio-historical theory of epidemic disease, Virchow also included the so-called psychic epidemics, a field in which interest has again been aroused by the events of our own time.[24]

If society has an obligation to protect the health of its members, and it is recognized that social and economic conditions have an important effect on health and disease, then it follows logically that *steps must be taken to promote health and to combat disease, and that the measures involved in such action must be social as well as medical.* This is the *third* principle involved in the idea of medicine as a social science, and was recognized by Virchow, Neumann and the other

[22] *Medicinische Reform*, p. 45.

[23] Virchow: *Einheitsbestrebungen*, p. 47.

[24] It is interesting to note that Temkin and Hirschfeld in 1929 called attention to Virchow's theory of epidemic disease and pointed out the astonishing proximity of his view to that expressed by Sigerist in 1928. See O. Temkin: Studien zum "Sinn"-begriff in der Medizin, *Kyklos* (1929), vol. 2, p. 103; E. Hirschfeld: Virchow, *Kyklos* (1929) vol. 2, pp. 110-111; H. E. Sigerist: Kultur und Krankheit, *Kyklos* (1928), vol. 1, pp. 60-63.

medical men who participated in the movement of 1848. The broad outlines of the program of action proposed as a result of the acceptance of this principle are probably represented best by a draft for a Public Health Law prepared by Neumann and submitted to the Berlin Society of Physicians and Surgeons on March 30, 1849.[25] According to this document: [26]

I. Public Health has as its objectives
   1. The healthy mental and physical development of the citizen;
   2. The prevention of all dangers to health;
   3. The control of disease.

II. Public Health must care for
   1. Society as a whole by considering the general physical and social conditions that may adversely affect health, such as soil, industry, food and housing.
   2. Each individual by considering those conditions which prevent him from caring for his health. These may be considered in two major categories:
      a. Conditions, such as poverty and infirmity, where the individual has the right to request assistance from the state;
      b. Conditions where the state has the right and the obligation to interfere with the personal liberty of the individual in the interest of health, e. g. in cases of transmissible disease and mental illness.

III. Public Health can fulfill these duties by
   1. Supplying well trained medical personnel in sufficient number;
   2. Adequate organization of the medical personnel;
   3. Establishing appropriate institutions for public health.

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[25] *Medicinische Reform*, p. 227 seq.

[26] Gertrud Kroeger: *The Concept of Social Medicine as presented by Physicians and other Writers in Germany, 1779-1932*, Chicago, Julius Rosenwald Fund, 1937, pp. 14-15.

Voices were raised for governmental action, and many specific measures were proposed, all of which fall within the broad program drafted by Neumann. A very important problem was the provision of medical care for the indigent, and proposals were put forth by Virchow and others for public medical services for the poor, including free choice of physicians.[27] It was realized, however, that provision of medical care was not enough, that it must go hand in hand with social prophylaxis. In consequence, we find Virchow proclaiming the *right of the citizen to work*, as a fundamental principle to be included in the constitution of a democratic state.[28] (Here Virchow was influenced by the action of the French Provisional Government of 1848 in recognizing the right to work, the doctrine of the *Droit au travail* that Louis Blanc had been preaching since 1839.)[29]

The problem of the industrial worker also demanded attention. Although industrialization in Germany began later than in England and France, and proceeded at a slower pace during the first half of the 19th century, by 1848 the existence of a wage-earning class, an industrial proletariat, could no longer be overlooked. As in England and France, industrialization was ushered in by a slaughter of the innocents. Those that survived the cradle were given over to the tender mercies of the factory and the mine. It was plain, said Virchow, that "the proletariat in ever increasing degree became the victim of disease and epidemics, its children either died prematurely or developed into cripples."[30] To deal with this problem Leubuscher proposed a program of industrial hygiene, with emphasis on the legislative regulation of working conditions.[31] Particularly important was the question of limiting the working day. Leubuscher advocated the prohibition of child labor before the age of fourteen, reduction of the working day in dangerous occupations, protection of pregnant women, the establishment of standards for ventilation

[27] *Medicinische Reform*, pp. 127, 185, 189, 190.

[28] *Ibid.*, p. 38.

[29] J. A. R. Marriott (editor): *The French Revolution of 1848 in its Economic Aspect. Vol. I, Louis Blanc's Organisation du Travail. . . .* Oxford, The Clarendon Press, 1913, pp. xxxvi-lxix.

[30] *Medicinische Reform*, pp. 126-127.

[31] P. Leubuscher: Zur Reform der Sanitätspolizei, *Medicinische Reform*, pp. 11-12, 47-49.

of work rooms, and the prevention of industrial poisoning through the use of non-toxic materials.

Demands were also made for uniform licensure of medical practitioners entitling them to practice in every German state; appointment of physicians to official positions on the basis of competitive examinations; and the establishment of a National Ministry of Health.[32]

Very important was the recognition that for investigation of the causal relations between social conditions and medical problems it was necessary to have reliable statistics. The significance attributed by Virchow to medical statistics is indicated by his statement that "Medical statistics will be our standard of measurement: we will weigh life for life and see where the dead lie thicker, among the workers or among the privileged." [33] It was Neumann, however, who was most active in agitating for the collection of accurate statistics. In 1847, he pointed out that without medical statistics there could not be an efficient organization of medical activity.[34] Several years later, Neumann made it clear that what he wanted was not medical statistics in any narrow sense; he called for "social statistics," that is statistical information on all elements of social life that in any way have a bearing on problems of health and disease.[35] Neumann carried on statistical investigations in line with these principles, and reference will be made to these studies in the following section.

An explanation of the cleavage between Behring and Virchow emerges from the preceding analysis of the idea of medicine as a social science. For Virchow who saw medicine in its organic relations to the rest of society, and recognized health and disease as enmeshed within the web of social activity, the strict bacteriological view could not but seem narrow and limited, if not a complete intellectual aberration. Virchow recognized the discoveries of the bacteriologists, but he could never accept an unqualified causal rela-

[32] *Medicinische Reform*, pp. 13-16 (especially page 14). See also Ackerknecht, *op. cit.*, pp. 113-130.

[33] *Medicinische Reform*, p. 182.

[34] Neumann: *Öffentliche Gesundheitspflege*, p. 84.

[35] Neumann: Zur medicinischen Statistik . . . pp. 86-89 (see footnote p. 274).

tionship between bacterium and disease. For him the tubercle bacillus was not identical with tuberculosis.

The views of Virchow and his collaborators did not mature in their own day, but the seed had been sown. With the defeat of the revolution of 1848, the medical reform movement came to a quick end. Virchow had to discontinue the publication of the *Medicinische Reform*, but in his last editorial, comparing the contemporary situation with that which faced Moses after bringing Israel out of Egypt, he wrote:

> We too must wander in the wilderness and fight. Our task is an educational one; we must train men capable of fighting the battles of humanism. We have nothing more to expect from the governments so that further publication of a periodical is useless. Among the doctors, those who are capable of further education need no continuous guidance, while the indolent dullards will never be affected by reason. We can therefore only accept the task of educating the people concerning problems of public health, and problems of earning their daily living, and of assisting them through the continuous provision of new teachers to achieve the broadest basis for the winning of the final victory. The medical reform that we had in mind was a reform of science and society. We developed its principles; even without the further existence of this organ they will advance. Every moment, however, will find us occupied in working for them and ready to fight for them. Our cause remains unchanged; it is only the field of activity that changes.[36]

III.

From Virchow to Grotjahn. England, Belgium, and Germany to 1900

Beliefs of men regarding social organization and social change, and their attitudes toward the society in which they live, may be viewed as variations on the themes of desire and expectation. While the middle class in Germany was fighting for political power, the English middle class had already attained its goal. This situational difference finds its reflection in varying social philosophies. In Germany, the democratic radicals put forth a charter of liberty for the people in which they proclaimed the preeminence of human rights and human dignity, and accepted the logical consequences of this

[36] *Medicinische Reform*, p. 274.

charter in relation to health and disease. In England, on the other hand, the same doctrine of liberalism, with its implications of human rights, human dignity, liberty and equality, had already woven itself into public consciousness, but had emerged with a different emphasis as the doctrine of economic liberalism. This philosophy with its acceptance of social atomism and the predetermined harmony of man and nature manifesting itself through inexorable economic laws carried with it a stubborn insistence on the absolute necessity of submission to the supposed laws of society. Even the protests against the effects of economic liberalism on the lives of men did not substantially alter the doctrine. Discrepancy between social fact and social theory was not generally recognized as affecting the hard central core of economic liberalism, and it was not until the latter part of the nineteenth century that the gradual and peripheral erosion which had been carried on in practice began to receive conceptual recognition.

Such an intellectual environment was hardly conducive to analyses of the social aspects of health and disease, and no thoroughgoing theoretical formulations like those of the German authors were developed. And yet, certain stubborn facts insisted upon intruding themselves into public consciousness. Questions of ill-health, poor housing, dangerous and injurious occupations, excessive morbidity and mortality could not be overlooked, and investigations of these social problems were undertaken, often by medical men, to find out how they had arisen.

From this point of view it is instructive to look at a study of *The Moral and Physical Condition of the Working Classes Employed in the Cotton Manufacture in Manchester* published in 1832 by James Philips Kay, M. D. Permeating this anatomy of social misery is the bleak gospel of contemporary economic orthodoxy. At the very outset, Kay emphasizes that the immutable laws of economics cannot be transgressed. "The evils here unreservedly exposed," he says, "so far from being the necessary consequences of the manufacturing system, have a remote or accidental origin, and might, *by judicious management*, be entirely removed. Nor do they flow from any single source: and, especially in the present state of trade, the hours of labour cannot be materially diminished, without

occasioning the most serious commercial embarrassment." [37] It must be kept in mind that this was the period when Richard Oastler was leading the campaign for a shorter working day.[38] In reply to this demand the employers argued that a cut in hours meant that wages would have to be cut in direct proportion. Furthermore, the interests of both workers and employers were complementary and were menaced by foreign competition. Injudicious agitation and legislation would therefore harm the workers more than it would help them. What was needed was not factory legislation, but free trade. In this spirit, Kay pointed out that

> The profits of trade will not allow a greater remuneration for labour, and competition even threatens to reduce its price. *Whatever time is substracted from the hours of labour must be accompanied with an equivalent deduction from its rewards*, and we fear that the condition of the working classes cannot be much improved, until the burdens and restrictions of the commercial system are abolished.
>
> Those political speculators who propose a serious reduction of the hours of labour, unpreceded by the relief of commercial burdens, and unaccompanied by the introduction of a *general system of education*, appear to us deluded by a theoretical chimera.[39]
>
> Believing that the natural tendency of unrestricted commerce, is to develop the energies of society, to increase the comforts and luxuries of life, and to *elevate the physical condition* of every member of the social body, we have exposed with a faithful, though a friendly hand, the condition of the lower orders connected with the manufactures of this town, because we conceive that the evils affecting them result *from foreign and accidental causes*. A system, which promotes the advance of civilization, and diffuses it over the world—which promises to maintain the peace of nations, by establishing a permanent international law, founded on the benefits of commercial association, cannot be inconsistent with the happiness of the *great mass of the people*.[40]

Nevertheless, the prevalence of disease among the poor could not be overlooked, and as Kay himself points out it was the high inci-

[37] J. P. Kay, *The Moral and Physical Condition of the Working Classes Employed in the Cotton Manufacture in Manchester*, London, James Ridgway, 1832, p. 1.

[38] Cecil Driver: *Tory Radical. The Life of Richard Oastler*, New York, Oxford University Press, 1946, pp. 118-190.

[39] Kay, *op. cit.*, pp. 59-60.

[40] *Ibid.*, p. 47.

dence of communicable disease that led to an investigation of the Manchester workers. It was found that vice, physical degradation, poverty and illness were intimately interlocked. For proof of the relation of ill health to other forms of social pathology, Kay cites the records of the medical charities of Manchester. After reviewing the statistical data, he is led to conclude for example, that more than half the inhabitants of Manchester are "either so destitute or so degraded, as to require the assistance of public charity, in bringing their offspring into the world."[41] Yet Kay can see no necessary relation between existing socio-economic organization and the various kinds of social maladjustment that he had observed. It is indeed an instructive study in the situational determination of ideas to analyze Kay's presentation, for he remains an acute observer throughout. In fact, in one respect he is much in advance of his own time. Discussing the Irish immigration and the consequent effect on conditions in Manchester, he indicates an awareness, as yet unclear and lacking precise conceptual formulation, that the dismal scenes in his portrayal are the product of a cultural cataclysm.[42] Anthropologists have recently recognized that the change that affected a large part of white society in the early days of capitalism is similar to the changes among various African peoples under the influence of contact with white civilization.[43]

Other physicians did recognize, however, that social and economic institutions, especially industrialism, had significant and necessary connections with the health problems of the factory workers. Outstanding in this respect was C. Turner Thackrah, whose pioneer treatise on occupational medicine, *The Effects of Arts, Trades, and Professions . . . on Health and Longevity . . .*, first appeared in 1831. This book became a bible among the factory reformers, and Thackrah actively supported the struggle to restrict child labor.[44]

> The employment of young children in *any* labour is wrong . . . [he said] No man of humanity can reflect without distress on the state of thousands

[41] *Ibid.*, pp. 40-42.

[42] *Ibid.*, pp. 6-7.

[43] R. C. Thurnwald: *Black and White in East Africa; The Fabric of a New Civilization*, 1935.

[44] The writer has in his possession a copy of the second edition (1832) of Thackrah's book with a presentation inscription by the author to Michael Thomas Sadler, parliamentary spokesman of factory reform.

of children, many from six to seven years of age, roused from their beds at an early hour, hurried to the mills, and kept there with the interval of only 40 minutes, till a late hour at night; kept, moreover, in an atmosphere impure, not only as the air of a town, not only as defective in ventilation, but as loaded also with noxious dust. Health! cleanliness! mental improvement! How are they regarded? Recreation is out of the question. There is scarcely time for meals. The very period of sleep, so necessary for the young, is too often abridged. Nay, children are sometimes worked even in the night.[45]

In 1831, at a meeting in Leeds in support of factory legislation, Thackrah was present on the platform with Richard Oastler and Michael Sadler. He made a forceful speech condemning the lack of regulation of working conditions, and citing the cases of some of his child patients in support of his position. Was it any wonder, he demanded, that the resistance to disease of the rising generation was being undermined by prevailing conditions? [46]

During the early 'thirties, however, the climate of opinion was still unfavorable to any basic change. Economic and religious doctrine encouraged acceptance of the status quo, and discouraged any attempts to change conditions. Economic success was evidence of divine favor, while failure implied the absence of religious sanctity, and was therefore indicative of moral inadequacy.[47] Any effort to alter existing conditions was consequently an impiety and dangerous to social welfare for it meant that one was interfering with the predestined law of God.

Peter Gaskell presented in 1833 a survey of the "manufacturing population of England" in which he showed how the introduction of steam power and the consequent industrial revolution had affected the workers and their families. He saw that the conditions under

[45] C. Turner Thackrah: *The Effects of Arts, Trades and Professions, and of Civic States and Habits of Living, on Health and Longevity*, Second Edition, Greatly Enlarged, London and Leeds, 1832, p. 80.

[46] Driver, *op. cit.*, pp. 135-136.

[47] For the background out of which these ideas developed and the process by which they came into being see Max Weber: *Gesammelte Aufsätze zur Religionssoziologie* (vol. I), Tübingen, 1922, pp. 17-206; Ernst Troeltsch: *Die Soziallehren der christlichen Kirchen und Gruppen*, in his *Gesammelte Schriften* (vol. I), Tübingen, 1923, pp. 710 ff.; R. H. Tawney: *Religion and the Rise of Capitalism*, New York, 1926; Erich Fromm: *Escape from Freedom*, New York, 1941.

which the factory hands lived and worked affected their health. "Life," he concluded, "though not necessarily shortened by manufacturing occupation, is stripped of a most material portion of that which can alone render it delightful—the possession of health, and those who are engaged in it may be said to live a protracted life in death." [48] Nevertheless, he points out that "the health and physical condition of the manufacturing population have their origin, and are dependent in a great degree upon the perversion of their moral and social habits." Therefore the first step "to be made is to improve the moral condition of the labouring population—without this nothing can avail it." [49] Furthermore, in discussing child labor he says:

> The employment of children in manufactories ought not to be looked upon as an evil, till the present moral and domestic habits of the population are completely re-organised. . . . There can be no question but that very considerable practical difficulties lie in the way of any extensive change as to the hours of labour. . . . It is doubtful if any legislative interference can be effective; but on the other hand, whether it may not most materially injure the future prospects of the labourers, and accelerate a fate already too rapidly approaching them. Still some modifications might be made to satisfy the claims of nature and humanity, contradistinguishing these from fanaticism and bigoted ignorance.[50]

As the decade of the 'thirties passed, however, and the decade of the 'forties came to occupy the scene, a gradual but definite shift in thought on the social aspects of health and disease became evident. The reports to the Poor Law Commission culminating in 1842 in Chadwick's classic *Inquiry into the Sanitary Condition of the Labouring Population of Great Britain*, and in 1844 in the report of the Health of Towns Commission provided a factual base for this ideological maneuver. Indicative of the change are the comments of Arthur Helps in 1845. "However true it may be," he wrote, "that moral remedies are the most wanted, we must not forget that such remedies can only be worked out by living men"; and while "a

[48] P. Gaskell: *The manufacturing Population of England, its Moral, Social and Physical Conditions, and the changes which have arisen from the use of Steam Machinery.* . . . London, Baldwin and Cradock, 1833, p. 239.
[49] *Ibid.*, pp. 215-216.
[50] *Ibid.*, pp. 209-210.

primâ facie reluctance to all interference is most reasonable . . . , nevertheless, interference must often be resorted to" in the interests of social improvement.[51]

Recognition of the causal relations existing between social problems and medical conditions went hand in hand with programs for remedial action. Most of this activity was empirical, and hardly any effort was made to develop a theoretical foundation for such programs. On this account alone considerable credit would be due to Henry W. Rumsey for his attempt to formulate a theory of public health and medical care within the framework of social organization and social action. Yet Rumsey deserves still higher praise; not only did he undertake to formulate a social policy for medicine, but he clearly visualized and set up goals which still remain unattained. In 1856, he published a volume entitled *Essays on State Medicine*, in which among other subjects he dealt with the provision of medical care to the poor. Rumsey's position is characterized by his statement that

> upon the right ordering of a State Provision for the medical care of the poorer classes in their own dwellings, depends the stability and efficiency of the whole superstructure of Medical Police.
>
> And I say *Care* of the poor, because it is now pretty generally acknowledged that any such provision, to be permanently useful, must not be limited to mere routine attendance on cases of actual illness and accident, to a perfunctory supply of pills and potions, with a bald return of names, diseases, visits, etc., from uneasy officers to incompetent Boards.[52]

He went on to show that the promotion of health and the prevention of disease were matters of social concern and required governmental action.

> Sanative care, as well as instruction [he contended] are beyond the means of half the population. Both are imperatively necessary for the safety of the Commonwealth—for the health and happiness of the people. Both may be bestowed gratuitously, from a right source, without causing pauperism. Nay,

[51] [Arthur Helps]: *The Claims of Labour. An Essay on the Duties of the Employers to the Employed. The Second Edition. To which is added, an Essay on the Means of Improving the Health and Increasing the Comfort of the Labouring Classes*, London, William Pickering, 1845, pp. 195, 245.

[52] Henry W. Rumsey: *Essays on State Medicine*, London, John Churchill, 1856, p. 239.

they are the best means of preventing it, by promoting health and longevity, and by enabling the sick and the ignorant to work usefully and profitably. Both therefore should be brought home to every working man's family; and both need to be directed and administered by specially qualified authorities.[53]

Finally, Rumsey described the medical personnel whom he visualized as carrying on such a program. The functions of a "district medical officer" should be preventive in nature. In detail, his description of the duties of such an officer comprises much of the modern public health program. Rumsey insisted that the health officer would become

the sanitary adviser of the poor in their dwellings. Many removable causes of sickness within their own control would be pointed out during his beneficent visits. The miserable effects of alcoholic stimulation might be impressed on the minds of sufferers from intemperance, at times when no warnings or counsel save those of a medical visitor would be listened to.

The state of the apartments of the poor, their clothing and bedding, the choice and preparation of their food, the physical management of their children, their nursing in sickness,—would all come occasionally under his cognizance. He would often be the first to detect unwholesome occupations or trades in the neighborhoods by their effects on those under his charge. In the execution of his ordinary duties, he might often be led to suspect the adulteration or impurity or decay of some article of food, or the deleterious qualities of some pretended medicine or falsified drug taken by the poor. . . . [In short], he would be, in a peculiar sense, the Missionary of Health in his own parish or district—instructing the working classes in personal and domestic hygiene—and practically proving to the helpless and the debased, the disheartened and disaffected, that the State cares for them,—a fact, of which, until of late, they have seen but little evidence.[54]

At the time when Rumsey expressed these views the health officer was still a novelty. The first Medical Officer of Health in England was Dr. W. H. Duncan, who in 1847 was appointed to this office at Liverpool. In 1848, the Corporation of the City of London appointed John Simon to a similar post.[55] Chadwick had suggested in 1842 that a "district Medical Officer" should be appointed locally, and the Public Health Act of 1848 contained power for the appoint-

[53] *Ibid.*, p. 248.
[54] *Ibid.*, pp. 280-282.
[55] John Simon: *English Sanitary Institutions*, London, John Murray, 1897, pp. 246-248.

ment of medical officers of health in England, with the exception of London. In 1855, the Metropolis Management Act provided for the appointment of such officers in London (outside the City).[56]

The appointment of health officers for various London districts, as well as for many provincial towns, and the fact that the subject of public health had attracted considerable attention led the authorities of St. Thomas's Hospital in 1856 to establish a course of lectures on public health, the first of its kind in England.[57] Dr. Edward Headlam Greenhow was appointed to this lectureship. In preparing his first course of lectures, he realized that a good deal of the information upon which the health agitation of the preceding twenty years had been based was vague and inadequate. When he wanted to consider the preventable causes of disease, Greenhow found that statistical information on this score was defective. He determined to supply this deficiency and worked on his project for about a year. At the request of John Simon, this study appeared in 1858 as a parliamentary report of the General Board of Health.[58]

In his conclusion, Greenhow pointed out that the causes which produce the prevalent diseases of unhealthy places

> are multifarious; and that, whilst an impure atmosphere, whether the impurity arise from the defective removal of refuse and excrete matters, from the overcrowding of dwellings, or from manufacturing processes, is among the most powerful, there are many other causes of disease to which attention has hitherto been too little directed. Insufficient or unsuitable food, sedentary habits, the absence of the physical and mental stimulus afforded by variety of scene, and especially by rural prospects, the weariness caused by the monotonous character or many occupations, and, not least, the cares and anxieties of life are all of them causes which help to swell the catalogue of

[56] George Newman: *The Building of a Nation's Health*, London, Macmillan and Co., Ltd., 1939, p. 15.

[57] John Simon relates that the "arrangements at St. Thomas's Hospital were in adoption of proposals which I, as member of the School, had made there" (*English Sanitary Institutions*, p. 266 footnote).

[58] General Board of Health. *Papers Relating to the Sanitary State of the People of England: Being the Results of an Inquiry into the different Proportions of Death produced by certain Diseases in different Districts in England; communicated to the General Board of Health by Edward Headlam Greenhow, M.D. . . . with An Introductory Report by the Medical Officer of the Board, on the Preventability of certain Kinds of Premature Death*, London, Eyre and Spottiswoode, 1858.

illness, and to add to the register of deaths in great cities. Some of these causes of preventable sickness and premature death arise necessarily from the circumstances of our social system, and are but little, if at all, under the control of the executive government. Notwithstanding their exclusion from the catalogue of removable causes of unhealthfulness, there would yet remain ample scope for the employment of hygienic measures. . . . One of the most evident facts brought to light by the present investigation is the influence of occupation on health. This influence is either direct . . . ; or it is indirect, as where the employment of women in factories seems to aggravate the infantile mortality, and particularly that produced by the nervous diseases of childhood. It is probable that a careful examination into the nature of these employments, and the manner in which their hurtful results are produced, would show that such results are not the inevitable consequences of the several industrial occupations. . . .

It may be more difficult to deal with the other branch of this question. The withdrawal of children from their mother's care, and the consequent substitution of artificial feeding for the natural diet of infancy, which is probably one at least among the causes of a large infantile mortality in places where the female population are largely engaged in factory labor, is possibly an evil inherent in the modern factory system. Whether it can be met without an undue interference with the rights of labour is a question the consideration of which forms no part of my present duty.[50]

In his introduction to Greenhow's report, John Simon concurred in the findings of his colleague and went on to emphasize the necessity for considering,

whether the advantages of our social progress must have with them such evils as I have described; whether the higher civilization of urban life cannot be attained without a corresponding development of diseases, which depend on the non-removal of excrement, and the non-ventilation of dwellings; whether the manufacturing greatness of England be not compatible with better sanitary care for the lives of the employed, and with less enormous entail of infantine [sic] disease. . . .

Nor probably will such questions appear unimportant to the public economist. For the physical strength of a nation is no mean part of its prosperity. And with us, perhaps, that raw material may have risen in value, while eastern war and westward emigration have been draining into their respective channels so much of our English manhood.

But if the subject may justly claim to be considered by the government and the legislature of this country, it is on higher grounds than those. The sacredness of human life against unjust aggression is the principle above all others

[50] *Ibid.*, pp. 131-133.

by which society subsists. To have realized this principle in law and government is the first indication of a social state. . . .[60]

This document showed the necessity of constituting some machinery by which the British government might institute methodical inquiries wherever there appeared to be an excess of disease. That this argument was accepted by Parliament may be inferred from the Public Health Act of 1858, which authorized the Privy Council to institute from time to time such inquiries concerning matters of the public health as they might see fit. John Simon became Medical Officer to the Privy Council and undertook various studies on its behalf. During the period 1862-1865, Simon was particularly concerned with the investigation of "*food-supply*, of *house accommodation* and the *physical surroundings*, and of *industrial circumstances*. . . ."[61]

In the Sixth Report to the Privy Council (1863), Simon presented the results of an inquiry into the dietaries of the poor carried out by Dr. Edward Smith. Malnutrition was prevalent, Simon reported, and

from such degrees of it as Dr. Smith found existing among the lowest fed of the examined classes, there must, I feel assured, be much direct causation of ill-health, and the associated causes of disease must be greatly strengthened by it in their hurtfulness. These are painful reflections, especially when it is remembered that the poverty to which they advert is not the deserved poverty of idleness. In all cases it is the poverty of working populations. Indeed, as regards the in-door operatives, the work which obtains the scanty pittance of food is for the most part excessively prolonged. Yet evidently, it is only in a qualified sense that the work can be deemed self-supporting. All disease of such populations, and whatever destitution results from it, must be treated at public expense. . . .

How far (if at all) the described circumstances of our poorest labouring population tend to better themselves, and how far (if at all) they may be bettered by interference from without, are questions which cannot be discussed without reference to parts of political economy on which I am incompetent to speak. Indirectly, indeed, those questions are of the vastest sanitary importance, for the "public health" of a country means the health of its masses, and the masses can scarcely be healthy unless, to their very base, they be at least moderately prosperous. And although the satisfactory solu-

[60] *Ibid.*, pp. xlvi-xlvii.
[61] Simon, *op. cit.*, p. 293.

tion of those questions is a task for other sciences than the science of medicine to fulfil, yet assuredly, if that solution can be given, the ultimate result will be among the foremost gains which a department of public health can have to record.[63]

Clearly, by the decade of the 'sixties, considerable advance had been made in Britain toward a socially oriented view of health and disease. Although this position was not as sharply defined as the German idea of medicine as a social science, various medical writers and administrators had recognized that social and economic conditions were intimately related to the greater or lesser prevalence of disease, and that these relations should be made the subject of exact scientific investigation, utilizing in considerable measure statistical materials and methods. Somewhat slower to develop was an overt recognition that the health of the people was a matter of direct social concern, and that social as well as medical measures were necessary for the prevention of disease and the promotion of health. Economic liberalism was evidently still the dominant social philosophy, but in practice it was gradually being recognized as ultimately untenable for an industrial society. For example, the establishment of a system of free medical advice to all the wage-earners in England and Wales was seriously under consideration in 1870 by the Poor Law Board. "The economical and social advantages of free medicine to the poorer classes generally," said a member of the board, "as distinguished from actual paupers, and perfect accessibility to medical advice at all times under thorough organization, may be considered as so important in themselves as to render it necessary to weigh with the greatest care all the reasons which may be adduced in their favour." [63] It was in the decade of the 'eighties however, that the interplay of long term trends and particular events came to focus in a new formulation of social problems and values.[64] Out of this rephrasing of social goals and ideologies there would in time develop a theory of social medicine.

[63] John Simon: *Public Health Reports* (2 vols.), London, J. and A. Churchill, 1887, vol. II, pp. 97-98.

[64] Sidney and Beatrice Webb: *The State and the Doctor*, London, Longmans, Green and Co., 1910, p. 7.

[64] Helen Merrell Lynd: *England in the Eighteen-Eighties*, New York, Oxford University Press, 1945, pp. 3-19 and 61-112.

But while British developments were still in the future, a Belgian doctor had already presented a well-developed system of social medicine. This was the achievement of Dr. Meynne, an army doctor, whose book, *Topographie Médicale de la Belgique*, appeared in 1865. (It is interesting to note that while on the titlepage, the subtitle read: *Études de géologie, de climatologie, de statistique et d'hygiène publique*, on the wrapper this is covered by a superimposed square of paper bearing the subtitle: *Études d'hygiène publique et médecine sociale, de statistique, de climatologie et de géologie médicales.*)

Under the influence of the Industrial Revolution in England, and the urgent necessities of the Napoleonic Imperium, Belgium had early achieved a high degree of industrialization. As Clapham remarks, Belgium was the one country in Europe " which kept pace industrially with England, in the first half of the nineteenth century." [65] But as in England, industrialization was followed by grave social problems, not the least of which was wide prevalence of disease, especially in the industrial population. Studies and inquiries into the social, economic and medical status of the Belgian people had been carried out at various times during the thirty years preceding the publication of Meynne's work. As a result he had at his disposal a considerable mass of data, and this is reflected in the scope and comprehensive character of his *Topographie Médicale*.

Meynne originally undertook this treatise to provide a medical topography (or in other words, a local medical geography) of Belgium.[66] But the book can only partly be called a medical topography, for Meynne went beyond a study of the distribution of prevalent diseases in relation to causative factors. In the last analysis, he presented a treatise on the social pathology and social hygiene of Belgium. Deeply imbued with the basic importance of preventive medicine Meynne wrote:

> Curative medicine, which saves from death one person who is seriously ill here, and another elsewhere, undoubtedly accomplishes a meritorious task, but hygiene, which prevents thousands of cases of illness will always be

[65] Quoted in Knight, M. M., Barnes, H. E., and Flugel, F.: *Economic History of Europe in Modern Times*, Boston, Houghton Mifflin Company, 1928, p. 674.

[66] Meynne: *Topographie Médicale de la Belgique*, Bruxelles, H. Manceaux, 1865, pp. i-iii. For a discussion of medical topography and medical geography see Arne Barkhuus: Medical Geographies, *Ciba Symposia*, 6: 1997-2016, 1944-45.

superior to the former in terms of the social results achieved. The latter is medicine on a grand scale, medicine applied to the nations. . . .

Hygiene, which is based on a knowledge of morbid causes, will one day constitute the basis of all social science, because the public health will always be the primary wealth of a people, and because the national economy would soon find itself in a position of inferiority in relation to foreign countries if the physical strength of the working classes is going to be seriously affected. Hygiene will one day become the guide of the administrator, as well as of the legislator; and political economy instead of devoting itself too exclusively to investigation of national wealth will then take the sanitary status of populations as the point of departure for its doctrines.[67]

The *Topographie Médicale* is divided into four parts. The first deals with the geography, geology and climatology of Belgium; the second with the morbidity and mortality of the Belgian population, including a discussion of the causes of the most prevalent or most serious diseases; the third with the relations of the diseases to soil, climate, poverty, nutrition, housing, and alcoholism; and finally, the fourth section is concerned with a discussion of various preventive measures designed to alleviate or remove the conditions previously described. Meynne makes full use of statistical materials; for he recognized that statistics provided a formidable instrument for the study of the problems in which he was interested.

As a result of his studies, Meynne concluded that poverty was the most potent disease breeder of all, surpassing by far other alleged causes such as soil, climate, and contagion.

As a cause of the majority of serious diseases [he said] poverty surpasses all other influences, even those of soil and climate. In general, it may be said that *deaths and the diseases that lead to degeneration of the species are to be found in diverse social strata in proportion to the degree of poverty that they experience.*

We arrived at this remarkable contrast between the well-to-do classes and the laboring classes without any preconceived idea. In each chapter the results of statistics and of observation became more striking, the problem became clearer and more precise. At the end we found ourselves face to face with an important social fact: the excessive inferiority which afflicts the sanitary and physical state of the proletarian classes. Their life is very much shorter; they age prematurely; their progeny is less viable; they have twice as much chance of being attacked by tuberculosis and dyscrasic dis-

[67] Meynne, *op. cit.*, pp. iii-iv.

eases; they are much more exposed to all epidemic diseases; and they are almost alone subject to accidents and violent death. Let us note also that poverty is the primary cause in most cases of their ignorance, their lack of orderliness, and even of their debauchery and intemperance. In short, one may say that physical and moral decadence attacks fatally a large number of those who have the misfortune to be born in poverty.[68]

But, he went on, having studied the causes of disease it was now necessary to call attention to the means of preventing or controlling the majority of serious diseases. However, for one who thinks in terms of *prevention*,

the horizon expands far beyond the domain of medical prescriptions. In fact, it becomes a matter of nothing less than the suppression of prejudice, error and ignorance, the encouragement of salutary labor, the development of a sense of dignity on the one hand and the conquest of cupidity, and injustice on the other. For this immense program, it is necessary to have the collaboration of all men of good will, and above all the assistance and unified direction of the state and of the scientists.

Since we believe that the doctor is by right a member of this great scientific council, we have, as the conclusion of this study, boldly advanced our opinion regarding the most urgent capital reforms and economic remedies—at the risk of seeing some one object on the ground of our incompetence. . . . Certainly, no one can pretend to know everything, but we refuse to acknowledge the scholastic limits of each special science. All the sciences are sisters; they ought to join hands so that one day they will form a whole: the great social science.[69]

Meynne was convinced that the future belonged to public health, or, as he also termed it, preventive medicine. His conception of the field was impressively broad. It was to concern itself with the sanitation of soil and water; the hygiene of unhealthy and dangerous industries; the location, construction and operation of hospitals, prisons, schools and barracks; the supervision of food to prevent fraud and adulteration; child guidance and education; vocational guidance; premarital and family counselling—in short, it would come to play a part in education, public administration and political economy. In part, this far-sighted program has been realized in our time, but much still remains to be done.

More specifically, Meynne proposed that attention be given to

[68] *Ibid.*, pp. viii-ix. [69] *Ibid.*, p. xii.

rendering the worker more independent, and to protecting him from exploitation. He advocated higher wages, better housing, better nutrition, and amelioration of various social evils such as alcoholism. Recognizing the outstanding importance of nutrition, he proposed that special retail outlets for workers be set up where they could purchase food at cost price. Such establishments could likewise sell clothes and household furnishings. Meynne also asked for limitation of the working day, the raising of the age for apprenticeship, and improved working conditions in factories and shops with particular regard to occupational hygiene.[70] Note should also be taken of his proposal to set up a system of rural hospitals to serve the agricultural population. This idea was not new, for the problem of providing medical care and hospital service in rural areas had received considerable attention in France and Beligum.[71] What is new is the inclusion of this question in a system of social medicine. Finally, attention must be called to chapter VI of Meynne's treatise. Here he takes up the diseases of greatest importance, analyzes each in terms of its causation, and calls attention to the social factors involved. Among the diseases considered are pulmonary phthisis, scrophula, pneumonia, bronchitis, emphysema and asthma, cardiac diseases, rheumatism, arthritis, gout, neuralgia, gastro-intestinal maladies, typhoid fever, dysentery, scurvy, anthrax, cancer, smallpox, scarlatina, mental disease, epilepsy, chorea, deaf-mutism and epidemic diseases (cholera, typhus fever, diphtheria, whooping cough). This section is unique, for not until Grotjahn's *Soziale Pathologie* do we again find this kind of analysis.[72]

During the latter half of the nineteenth century, the idea of social medicine was kept alive in Germany and in some cases developed further by a few far-seeing and socially-minded men. In some instances their ideas were derived from the thought of 1848. The leaders of 1848, Virchow and Neumann, remained active in politics and loyal to their principles. Virchow was called back to Berlin in

[70] *Ibid.*, pp. 519-547.

[71] See the articles "Hygiène Rurale" and "Médecins Cantonaux" in *Dictionnaire d'Hygiène Publique* . . . edited by Ambroise Tardieu, Paris, J.-B. Baillière, 1854 (II), pp. 216; 465.

[72] Meynne, *op. cit.*, pp. 123-235.

1856, and in 1861 he became a member of the Berlin municipal council. In 1862 he was elected to the Prussian Landtag, and from 1880 to 1893 he served as a member of the Reichstag. Throughout this period, Virchow remained firm in the conviction that matters of health and disease were social as well as medical questions. In 1860, at the meeting of the German scientists and physicians, Virchow forcefully urged the need for combating and preventing the effects of illness and infirmity.

> When statistics show [he asserted], that in some localities one-third of all deaths is due to pulmonary diseases, and when phthisis in the narrower sense of the term produces 15 to 18 percent, and even more, of the deaths, it shows that disturbances exist in the development of our populations, disturbances which arise from political and social institutions, and are therefore preventable.[73]

Neumann likewise continued to study disease from a social viewpoint. Many of his investigations were statistical in nature. Between 1856 and 1866, he carried out and published three studies on morbidity and mortality in the laboring population of Berlin. When the Gesellschaft für soziale Medizin, Hygiene und Medizinalstatistik was organized at Berlin in 1905, Neumann was elected an honorary member; and at the time of his death in 1908, Alfred Grotjahn had already developed his concept of social hygiene.

During the three decades that followed 1848, the program of medical reform was transformed into a more limited program of sanitary reform, which was practically attainable. Nevertheless, the causal relationships between general social conditions and the health of individuals could not be overlooked. In 1867, Lorenz von Stein, jurist and administrator, in a treatise on public administration dealt with the administrative aspects of public health.[74] Stein pointed out that the health of individuals becomes a matter of public concern to the extent that individuals are subjected to noxious conditions over which they have no control, and to the extent that such persons become a burden on society. In these circumstances, he insisted, it is the duty of government to establish and to maintain conditions

[73] Karl Sudhoff: *Rudolf Virchow und die Deutsche Naturforscherversammlungen*, Leipzig, Akademische Verlagsgesellschaft, 1922, p. 14.

[74] For Stein see above, p. 677 and footnote 7.

that would protect the individual from any dangers arising out of social activity, and to re-establish and to promote in a positive manner the health of the affected individual.[75] Stein was considerably influenced by English health legislation, and cited the English experience in support of his thesis.

Contemporary with von Stein were a number of medical men who in varying degree recognized the importance of the influence of social conditions on health, and discussed this subject from varying points of view. One of the most interesting of these, and yet one of the least known is Eduard Reich (1836-1919), an eccentric and peripatetic medical scholar. He lived and taught in Jena, Göttingen, Bern, Strassburg, Gotha, Kiel, Würzburg, Erlangen, Koburg, and Sondershausen. In the course of his wanderings, Reich found the time to write a large number of books, the last of which appeared in 1910.[76] Most important of these is his *System der Hygieine* which appeared in 1870-71 in two volumes. In this treatise Reich offers a well-rounded presentation of what he conceived to be the field of hygiene. This work is the product of far-ranging scholarship and profound erudition. The wide reading upon which it is based may be inferred from some of the authors cited by Reich. Among these are Brillat-Savarin, P. J. G. Cabanis, Henry C. Carey, Girolamo Cardano, August Hirsch, Liebig, Paola Mantegazza, Malthus, Moleschott, Quetelet, the *Regimen Salernitanum*, Ramazzini, the economist J. B. Say, Virchow, Villermé, and J. G. Zimmermann.

The organization of Reich's *System* proceeds from his definition of hygiene. To the question "What is hygiene?" he said:

> I understand hygiene to be the totality of those principles, the application of which is intended to maintain individual and social health and morality, to destroy the causes of disease, and to ennoble man physically and morally. The concept of hygiene thus comprises far more than was formerly comprehended under dietetics and medical police. Hygiene deals with man as a whole, as an individual and as he manifests himself in the family and in

[75] Lorenz von Stein: *Die Verwaltungslehre*, III. Teil. Erstes Hauptgebiet. II. Teil, Stuttgart, J. G. Cotta, 1867, pp. 1 ff. See also Kroeger, *op. cit.*, pp. 18-19 (footnote 26 above).

[76] Alfons Fischer: *Geschichte des deutschen Gesundheitswesens*, Bd. II, Berlin, Kommissionsverlag F. A. Herbig, 1933, pp. 362-365.

society; it deals with man in all his conditions and relations. Consequently, hygiene comprises the entire physical and moral world, and collaborates with all the sciences whose subject is the study of man and his environment.[77]

Hygiene, or the theory of health and welfare, is the philosophy, science and art of healthy living for the individual, the family, society and the state. Its stream derives from three tributaries: the first arises from practical philosophy, the second from medicine, and the third from social science. Moral hygiene is an application of practical philosophy, social hygiene an application of social science, and dietetic (as well as climatic) and police hygiene are applied medicine.[78]

On this basis, Reich set up four branches of hygiene: moral hygiene, social hygiene, dietetic hygiene, and police hygiene. Within these categories, he undertook to explore human experience, both personal and social, as it bore on health. What Reich regarded as falling under each of these headings is evident from the table of contents of the *System*. It contains the following subjects:

1. *Moral Hygiene*
   - Moral acts
   - The passions
   - Intellectual life
   - Education
   - Religion and morality
2. *Social Hygiene*
   - Introduction
   - Population
   - Marriage
   - Labor and poverty
     - Labor
     - Poverty
     - Sources of poverty
     - Effects of poverty
     - Forms of poverty
     - Charity
     - Cooperative action
     - Conclusion
3. *Dietetic Hygiene*
   - Nutrition
   - Care of the Skin
     - Clothing
     - Cleanliness
     - Cosmetics
   - Gymnastics
   - Travel
   - The senses. Sleep. Reproduction
   - Habitation
   - Climate
4. *Police Hygiene*
   - The health office
   - The health law
   - Health control of food and stimulants
   - Health control of dwellings
   - Control of epidemics

From this outline it appears that while Reich's categories are not entirely congruent with those in use at present, his police hygiene

[77] Eduard Reich: *System der Hygieine* (2 vols. in one), Leipzig, Friedrich Fleischer Verlag, 1870-71, vol. I, p. xvi.
[78] *Ibid.*, p. xii.

may be regarded as equivalent to public health administration, dietetic hygiene as coinciding with personal hygiene, social hygiene as representing an early form of social medicine and social work, and moral hygiene as a combination of social psychology, sociology and health education. Of the greatest interest here is Reich's concept of social hygiene.

> Social hygiene [he asserted], is concerned with the welfare of society. On the basis of statistics it follows the phenomena of social life, surveys the population in its various states, observes marriage, studies labor, and descends into the slough of despond which is poverty, but not to bring some empty consolation, but rather to help and to save, to strengthen the weary and to awaken them to new life, and to support by means of charity those who cannot care for themselves.[79]
>
> It is the task of social hygiene to prevent diseases of society and to maintain the well-being of the civil community. In order to achieve this aim, social hygiene must examine critically the manifestations of social life, trace its currents to their source, and there undertake its regulatory and ameliorative work.
>
> There are two things which influence social life most powerfully, and give it a characteristic stamp and color. We refer to the total constitution of the individual, and to the property relationship. These two elements interact reciprocally. . . .
>
> Because social life depends, on the one hand, on the physical and moral constitution of individuals, and, on the other, on property, the measures taken by social hygiene can be effective only if they aim to improve the constitution, and at the same time make possible a natural development of the property relationship. Above all else social hygiene must wipe out poverty, for as long as this exists there can be no question either of improving the constitution, or of a normal development of economic relations. . . .[80]

To achieve his goal, Reich advocated self-help and cooperative action, measures which were widely advocated at the time, and which seem to be a reflection in some degree of Proudhonist social philosophy. In addition, he was an ardent advocate of health education for all age groups and social classes.

The ideas of Eduard Reich remained almost unknown, but similar views were expressed by his better-known contemporary, Max von Pettenkofer, and reached a wide audience.[81] On March 26 and 29,

[79] *Ibid.*, p. xxii. [80] *Ibid.*, p. 267.

[81] Pettenkofer is too well known to require an account of his life in this paper. For those readers who wish to consult biographical details, see E. E. Hume: *Max*

1873, Pettenkofer addressed the *Verein für Volksbildung* in Munich on the value of health to a city. The purpose of these lectures was to urge the need for thoroughgoing sanitary reform in order to improve health conditions in the city. It was Pettenkofer who made hygiene and experimental laboratory science, but he was fully aware that man's health is influenced not only by his physical environment but also by the social world in which he lives. After calling the attention of his audience to the need for sanitary reform, he warned his listeners not to expect a panacea. Health was a resultant of the combined action of a number of factors, and all of these would have to be taken into account.

At present [he said], it has become the fashion to think that the health conditions of a city are determined exclusively by good sewerage, abundant water supply and good toilets, and particularly by the introduction of water-closets. . . . [In applying these measures] we solve not even one-third of our problems, as foreign experience has shown. And so we must look around for other factors, in many other directions.

Our health is also determined, to a large extent, by nutrition; not only by the quality of food but also by its quantity. What we consume may not only be good or bad, but also too much or too little. . . .[87]

It is, therefore, necessary that we apply ourselves to this task which is becoming more urgent every day, since the prices of all foodstuffs are rising continuously. So long as man finds himself in circumstances that permit him to have all the food he wishes, and to select it freely, he usually finds instinctively what is good for him; but when he has to contend with poverty or when the food he receives depends on the will of another, then we need standards in order to know what kind of food is necessary and what the minimum quantity is. . . .[88]

Housing conditions are also extremely important. Housing exerts a great influence on our health in two ways, in that it must, first, allow us to get the fresh air we need, and, second, protect us against heat and cold. . . .

Customs and habits exert no small amount of influence on general health conditions. . . . Customs and habits include in my opinion, the amount that an individual generally spends from his earnings or income for food, drink, housing, clothing and other items, and also for luxuries. . . .

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von Pettenkofer, New York, Paul B. Hoeber, 1927; H. E. Sigerist: *Grosse Aerzte*, München, J. F. Lehmanns Verlag, 1932, pp. 288-292.

[87] Max von Pettenkofer: "The Value of Health to a City, Two Lectures, Delivered in 1873," Translated from the German, with an Introduction by Henry E. Sigerist, *Bull. Hist. Med.* 10:597; 602, 1941.

[88] *Ibid.*, p. 604.

Political and social conditions are also influential upon the health and mortality of a population. All over the world the rich generally enjoy better health and live longer than the poor. Every epidemic, whether intermittent fever, typhoid or cholera, takes a larger toll from the poorer classes, sometimes and in many places to such an extent, that particularly cholera was a few years ago still called a disease of the proletariat. The poor, of course, do not suffer more from disease than the rich because they have less cash in their pockets but only insofar as they are deprived of the necessities of life. . . .[84]

Pettenkofer went on to point out that the public health is a matter of community concern, and that any measures that may be taken to help those in need react to the benefit of all.

In every large community [he said], there are always many people who have not the means to procure for themselves the things that are absolutely necessary to a healthy life. Those who have more than they need must contribute to supply these wants in their own interest. . . . Whenever causes of disease cannot be removed or kept away from the individual, the citizens must stand together and accept taxation according to their ability. When a city provides good sewerage, good water supplies, good and clean streets, good institutions for food control, slaughter houses and other indispensable and vital necessities, it creates institutions from which all benefit, both rich and poor. The rich have to pay the bill and the poor cannot contribute anything; yet the rich draw considerable advantages from the fact that such institutions benefit the poor also. A city must consider itself a family, so to say. Care must be taken of everybody in the house, also of those who do not or cannot contribute toward its support.[85]

In view of this standpoint, it is not at all surprising to find Pettenkofer, in 1882, employing the term social medicine for hygiene.[86]

The significant influence that social institutions and conditions exert upon health was also pointed out by Nikolaus Alois Geigel (1829-1887). As a student, he had participated in the movement of 1848, and its ideology left a permanent impression on his thinking. In 1870, Geigel became professor of hygiene at Würzburg, and in 1874 published a monograph on public health in Pettenkofer's *Handbuch der öffentlichen Gesundheitspflege und der Gewerbekrankheiten*. The introduction to this monograph discussed the relation

[84] *Ibid.*, pp. 605, 607-608. [85] *Ibid.*, p. 609.

[86] Hynek Pelc: La Médecine sociale et son développement en Tchécoslovaquie, *Bruxelles médical* (No. 26), April 26, 1936.

of changing social and economic conditions to health and disease. Geigel dealt with the effects of the rise of capitalism, the growth of an industrial proletariat, increasing urbanisation and the unhygienic conditions under which workers were compelled to live, the dangerous materialism of the upper classes, and the influence exerted by the church, which he regarded as pernicious and reactionary. Like many of his predecessors and contemporaries, Geigel insisted on the need for accurate statistics that would throw light on social phenomena. Thus, he felt that fluctuations of food prices, or an increase or decrease in the consumption of agricultural and industrial products could be just as important (in fact even decisive) for the prevalence of disease as climatic changes, an increase or decrease in the size of the proletariat, or of the national wealth.

These ideas were not without influence. When the *Reichsgesundheitsamt* was set up in 1876, Dr. Struck, the first director of the organization, issued a programmatic memoir in which he set forth its objectives.[87] In this program medical statistics were given an exceedingly prominent position.

> The relations of people to each other [wrote Struck], the conditions under which they are born, develop, and work, their age, environment, their territorial distribution, the soil on which they live, the water that they drink, their economic status, their nutrition and so forth, all these shall be brought into relation with the diseases that occur among them, with the span of their lives and their mortality, in order to determine the causes which lead to illness and premature death.

The significance of such information was not lost on the leaders of the industrial workers. Commenting on Struck's program, August Bebel, the Social Democratic leader, said of this passage:

> Should such statistics show, for instance, that the housing, places of work, and nutrition of large groups of the population are absolutely inadequate, it follows necessarily that steps must be taken to improve them. The discussion of social questions is thus placed in the foreground, and based on official figures and conclusions that cannot be denied, the demands and practical proposals for changing conditions will attain an irresistible power, because

[87] *Denkschrift über die Aufgaben und Ziele, die sich das Kaiserliche Gesundheitsamt gestellt hat*, verfasst von Struck, Berlin 1878, cited by Fischer, *op. cit.*, (II), p. 307.

thousands and hundreds of thousands of people from all classes of the population will support them.[88]

The relation of health and hygiene to economics was pointed out in the same year by Heinrich Rohlfs, in an article advocating that Germany adopt an economic policy based on the national protectionism of Friedrich List. In the course of his discussion, Rohlfs quoted with approval Pettenkofer's remarks of 1875 that he conceived of "hygiene as the economics of health, just as economic science regards the production and distribution of goods. Just as it is not simply the fear of loss, but even more the striving for great gain which is the driving force in economic science, so this must also become the point of view of hygiene as the science of health. It is for hygiene to investigate and to evaluate all the influences in the natural and artificial environment of the organism, so as to be able by means of this knowledge to increase its well-being." [89] Rohlfs also pointed out that the establishment of the Reichsgesundheitsamt was a great advance and would have a considerable influence on the development of hygiene.

Nevertheless, despite an awareness of the social relations of health and disease, the last three decades of the nineteenth century in Germany were characterized by a social and cultural environment which was unfavorable for the development of this awareness to a clearer concept which would admit of practical medical application. To most Germans after 1871, the movement of 1848 was something from a strange past. The national aspect of the movement was still recognized, but the social ideals had been abandoned. The German intellectuals and the middle class accepted the policy of Bismarck, and for the most part gave up their progressive program. At the same time the extraordinary rapidity with which the natural sciences developed gave them an enormous prestige in medicine. To this was added the appearance of bacteriology with what seemed to

[88] August Bebel: *Das Reichsgesundheitsamt und sein Programm vom socialistischen Standpunkt beleuchtet*, Berlin, Verlag der Allgemeinen deutschen Associations Buchdruckerei, 1878, p. 9.

[89] Heinrich Rohlfs: Ueber das Wechselverhältniss der Nationalökonomie zur Hygiene in seiner historischen Ausbildung, *Deutsches Archiv für Geschichte der Medicin und Medicinische Geographie* 1: 70-106, 1878 (see p. 85).

be the answer to the problem of disease causation. Under these conditions, it was not difficult to overlook the patient and his environment and to equate germs and disease in the relationship of cause and effect. Not the patient but the disease became the prime concern of the physician. This was the position so sharply expressed by Emil Behring in 1893.

Yet at the very peak of the bacteriological triumph, interest in the significance of social conditions in the causation of disease led various physicians to react against the exaggerated bacteriological standpoint. Hüppe summed up this point of view in 1899 with the statement: "Hygiene is a social art which has developed in response to social need; consequently it must and will always be social hygiene, or it will not exist at all." [90] Only a few years later Alfred Grotjahn put forth his concept of social hygiene, which initiated the theoretical development of social medicine during the first half of the twentieth century.

IV.

Alfred Grotjahn and After

At the very time when Behring was ardently proclaiming bacteriology as the ultimate medical truth and Koch as its prophet, a young German medical student in search of a subject for a doctoral dissertation conceived the idea of systematically investigating medical problems in the light of social science, so as "to arrive finally at a theory of social pathology and social hygiene, which with its own methods . . . would be used to investigate and to determine how life and health, particularly of the poorer classes, are dependent on social conditions and the environment." [91] The student was Alfred Grotjahn, and throughout his life he pursued this aim, as he later characterized it, with "paranoid stubbornness." As a result he developed a systematic theory of social medicine, and profoundly influenced the development of this field of medical activity.

[90] Hueppe: *Handbuch der Hygiene*, Berlin 1899, p. 11, cited by Alfons Fischer: *Grundriss der sozialen Hygiene*, Berlin, Julius Springer Verlag, 1913, p. 23.

[91] Alfred Grotjahn: *Erlebtes und Erstrebtes. Erinnerungen eines sozialistischen Arztes*, Berlin, Kommissions-Verlag F. A. Herbig G. M. b. H., 1932, p. 72.

Grotjahn's thinking was deeply affected by two currents of thought. While yet a medical student he became a member of the Social Democratic Party, and occupied himself with the literature of socialism and social problems. Later he rejected Marxian socialism, and took his stand on the basis of social reformism. A more lasting influence was exerted by the economist and historian Gustav Schmoller, whose seminar Grotjahn attended during the winter of 1901-1902. Here he learned the methodology of the social sciences, and applied this knowledge in the preparation of a paper for the seminar. This paper dealt with the changes in food consumption of workers that had occurred in Germany and other countries as a part of the process of industrialization. This study was published by Schmoller in 1902, but the views expressed by Grotjahn aroused the antagonism of Max Rubner, then professor of hygiene at the University of Berlin. Grotjahn warned against judging diets too exclusively on the basis of caloric adequacy, and Rubner who had become world famous for his studies on the caloric aspects of nutrition took umbrage at these heretical, non-experimental opinions. This was the beginning of an extended conflict which divided the world of German medicine and hygiene until after the First World War. Rubner was successful for a while in preventing Grotjahn from obtaining an academic post. In 1912, he received a minor position under Carl Flügge, and eventually in 1920 he was appointed to the first chair of social hygiene established at the University of Berlin (the full story is to be found in Grotjahn's absorbing autobiography, *Erlebtes und Erstrebtes*).

As early as 1898 Grotjahn had already published a study of alcoholism from the viewpoint of social hygiene.[92] In 1902 in collaboration with his friend F. Kriegel, Grotjahn began the publication of his annual review and bibliography of social hygiene, demography, and medical statistics.[93] The scope of the subject as envisaged by

[92] Alfred Grotjahn: *Der Alkoholismus nach Wesen, Wirkung und Verbreitung*, Leipzig, 1898.

[93] A. Grotjahn and F. Kriegel: *Jahresbericht über soziale Hygiene, Demographie und Medizinalstatistik, sowie alle Zweige des sozialen Versicherungswesen*, published by Gustav Fischer Verlag, Jena, from 1902 to 1915, and by Richard Schoetz Verlag, Berlin, from 1916 to 1923. In 1925 the bibliographical section was continued in the *Archiv für Soziale Hygiene und Demographie*.

Grotjahn at this time may be inferred from the subject headings of the bibliography: 1. Methodology and history of social hygiene; 2. Population statistics and mortality; 3. Morbidity, prophylaxis and medical care; 4. Social hygiene of labor; 5. Social hygiene of nutrition; 6. Social hygiene of housing and clothing; 7. Social hygiene of childhood, and youth; 8. Public health; 9. Theory of degeneration, constitutional pathology, and sex hygiene.

On March 1, 1904, Grotjahn presented before the German Society for Public Health a paper on the nature and purpose of social hygiene.[94] In it he sketched the scope of social hygiene, gave a preliminary definition of the subject, and indicated the lines of probable future development. At the very outset, Grotjahn indicated that he preferred not to use the term social medicine, which he regarded as being too limited in its connotation. Since the establishment of the sickness insurance system by Bismarck in 1883, it had been used to refer to insurance medicine, and Grotjahn felt that it would lead to confusion if this term were applied to the broader field that he envisaged.

Up to that time, he pointed out, hygiene both in theory and practice had occupied itself with the noxious natural factors that threaten the human organism and with the means of combating and controlling these factors. This was essentially physical-biological hygiene. In applying the results of physics, chemistry and biology, it related man to his natural environment. But, Grotjahn insisted, as a science, hygiene cannot restrict itself to this aspect. Man has yet another dimension; he is a social being, and this cannot be overlooked.

> Man has learned to make himself independent of the direct influence of nature [Grotjahn asserted.] Between man and nature there is culture, which is linked to the social structures within which alone, man can be truly man. It is bound up with the horde, tribe, family, clan, community, state, nation and race, and with their economic forms that vary so widely historically and

[94] A. Grotjahn: Was ist und wozu treiben wir Soziale Hygiene? *Hygienische Rundschau* (No. 20), 1904 (As this paper was available to me only in the form of a reprint which Dr. Bruno Gebhard, of the Cleveland Health Museum very kindly put at my disposal, I am unable to give the page references. It appeared under the Verhandlungen der Deutschen Gesellschaft für öffentliche Gesundheitspflege zu Berlin, Session of March 1, 1904).

geographically. . . . Hygiene must therefore also study intensively the effects of these social conditions in which men are born, live, work, enjoy themselves, procreate and die. It thus becomes *social* hygiene, which takes its place beside physical-biological hygiene as a necessary supplement.

Grotjahn indicated that one of the major problems of social hygiene would be that of physical and social degeneration. With this in mind he emphasized the importance of a program of eugenics.

After these preliminary considerations Grotjahn went on to define his concept of social hygiene. He regarded social hygiene as having two aspects: one, descriptive, the other, normative.

Social hygiene as a *descriptive* science is concerned with the *conditions* that affect the spread of hygienic culture among groups of individuals, and their descendants, living under the same spatial, temporal and social conditions.

Social hygiene as a *normative* science is concerned with the *measures* which are intended to spread hygienic culture among groups of individuals, and their descendants, living under the same spatial, temporal and social conditions.

To elucidate this definition, Grotjahn remarked:

If it is the task of social hygiene as a descriptive science to picture the general existing state of hygienic culture, then as a normative science it is its conscious purpose to spread the hygienic measures, which at first always benefit a preferred minority, to the entire population and thus carry on a progressive improvement of existing conditions.

If social hygiene as a descriptive science has already shifted away from the natural sciences and has recourse to such ancillary sciences as statistics, economics, and so forth, as a normative science it is completely independent of the methods of natural science, and utilizes those of the social sciences. Cultural-historical, psychological, economic and political elements all enter into the calculus of social hygiene. Naturally, the goal as ever is to prevent as far as possible any damage to the health of the greatest number, or even of the entire community.

Finally, Grotjahn went on to discuss some of the ancillary sciences upon which social hygiene would have to rely. These were medical statistics, demography, anthropology (in particular anthropometry), economics and sociology.

This paper on the nature and purpose of social hygiene was also

published in a somewhat revised form as a preface to the third volume of the *Jahresbericht*.[95]

The sketch first presented in 1904 was later expanded by Grotjahn in the best known of his many publications, the classic *Soziale Pathologie*, which first appeared in 1911 and went through several editions. The book consists of two major parts, the first dealing with eighteen groups of diseases where the social relations of each group are discussed, the second with the general aspects of social medicine. In the first section, Grotjahn does on a larger scale what Meynne had attempted more than forty years earlier. A list of the subjects treated by Grotjahn is instructive. These are: acute communicable diseases, chronic communicable diseases, venereal diseases, skin diseases, cardiovascular diseases, diseases of the respiratory organs, gastrointestinal and metabolic diseases, occupational intoxications, rheumatism, dental diseases, gynecological and obstetrical conditions, diseases of infancy and childhood, nervous and mental diseases, surgical conditions, cancer, ophthalmic diseases, and diseases of the ear and the throat. In the general section, Grotjahn considered the following topics: the social evaluation of individual groups of diseases, the social value of medical activity in relation to social medicine, the social causation of disease, degeneration as the central problem of studies in social pathology, qualitative planning of human reproduction in relation to eugenics, quantitative planning of human reproduction in relation to decline of population, and the social value of hygienic activity in relation to social hygiene.

Preceding the two major sections of *Soziale Pathologie* is an introduction which contains a number of fundamental principles that help to round out our presentation of Grotjahn's ideas. After a brief review of the history and the definition of social hygiene (or social medicine), he sets forth six points that are important for systematic study of human disease from a social viewpoint.[96]

[95] A. Grotjahn and F. Kriegel: *Jahresbericht über die Fortschritte und Leistungen auf dem Gebiete der Sozialen Hygiene und Demographie. Dritter Band: Bericht über das Jahr 1903*, Gustav Fischer, 1904, pp. i-xv.

[96] Alfred Grotjahn: *Soziale Pathologie. Versuch einer Lehre von den sozialen Beziehungen der menschlichen Krankheiten als Grundlage der sozialen Medizin und der sozialen Hygiene.* Zweite neubearbeitete Auflage, Berlin, August Hirschwald Verlag, 1915, pp. 9-18.

1. The significance of a disease from a social point of view is determined in the first place by the *frequency* with which it occurs. Medical statistics are therefore the basis for any investigation of social pathology.

2. A disease becomes socially significant not only through the frequency of its occurrence. It is necessary to know also the *form* in which the particular disease occurs most frequently. As a rule the characteristic textbook form is not the one in which the disease occurs most frequently, nor is it generally the form which is most affected by social conditions or in turn affects them. Consequently, it is necessary to determine the socio-pathological typical form.

3. The most important relations between the diseases and social conditions are naturally in the realm of causation. The etiology of disease is biological and social. So far only the biological etiology has been studied extensively. The same must be done for the social etiology of disease. The social basis of disease may be considered under the following heads: Social conditions (a) may create or favor a predisposition for a disease; (b) may themselves cause disease directly (c) may transmit the causes of disease; and (d) may influence the course of a disease.

4. Not only are the origin and course of diseases determined by social factors, but these diseases may in turn exert an influence on social conditions. This influence is exerted particularly through the outcome of the disease. This may manifest itself in death, recovery, chronic infirmity, predisposition for other illness, and finally, in degeneration.

5. In the case of a disease which is important from a social viewpoint, it must be established whether medical treatment can exert an appreciable influence on its prevalence, and whether such therapeutic success as may be achieved is important from a social point of view.

6. How can we prevent diseases or influence their course by social measures? This requires attention to the social and economic environment of the patient.

Grotjahn realized that many diseases of social importance were chronic in character. He recognized, however, that a large number

of these were preventable, and that health education could be an extremely important factor in this connection. He also accepted the fact that the voluntary health agency had a significant rôle to play in solving questions of social hygiene. Similarly, he was of the opinion that the physician should use his position to promote developments in medicine and social hygiene so that social hygienic measures could be applied to all the people. For the physician to understand these responsibilities, Grotjahn saw that the teaching of social hygiene would have to become a part of the medical curriculum. He himself taught at the University of Berlin, and academic instruction was also given at other German and Austrian medical schools.

Grotjahn was not an isolated phenomenon. He was only the outstanding figure of a group of men who during the first two decades of the twentieth century developed the concept of social medicine so that it could be used in medical education and medical practice. An important initial impulse toward the development of the field had derived from Bismarck's social insurance program. Many of the physicians realized, however, that to restrict the concept of social medicine to the medical aspects of social insurance was to take too restricted a view of the matter. Consequently, we find many of the men who wrote on social medicine attempting to define the field so as to broaden it and yet keep it within practical bounds.

The literature on social medicine that appeared during the period from 1900 to 1920 is extensive, and we can do no more in this survey than to select several authors who in some respect contributed to the development of the concept of social medicine.

At the opening of a course on social medicine in 1909 in Vienna, Ludwig Teleky discussed the tasks and the aims of social medicine.[97] "The task of social medicine," he said, "is to investigate the relations between the health status of a population group and its living conditions which are determined by its social position, as well as the relations between the noxious factors that act in a particular form or with special intensity in a social group and the health condi-

[97] Ludwig Teleky: Die Aufgaben und Ziele der sozialen Medizin, *Wiener klinische Wochenschrift*, 1909.

tions of this social group or class." With this definition, Teleky added an important element for an understanding of the nature of social medicine. By making use of the concept of social class, and calling attention to its significant rôle in the study of health differentials, he introduced an important methodological tool. In this sense he emphasized that the origin of social medicine and practical activity in this field derived from the existence of separate classes that are differentiated from each other not only through their social functions, but also by the different standards of life that characterize the members of these classes.

If this be the task of social medicine, for what purpose are these investigations to be carried out? To this Teleky's reply is that the goal of social medicine, on the basis of the knowledge obtained in special studies, is to contribute to the elimination of all elements that exert a deleterious influence on health and to the elevation of the general state of health. In order to accomplish this, it becomes necessary to go one step further and analyze the vague concept "social condition" (*soziale Lage*) into its component elements. When the sources of the malady have been uncovered, ways and means must be found to control these.[66]

Finally, Teleky summed up the matter in the following statement.

> Social medicine [he said] is the borderland between the medical and the social sciences. It determines the effect of given social and occupational conditions on health, and indicates how, by means of sanitary or social measures, such noxious influences can be prevented, or their effects eliminated or ameliorated. It is also the task of social medicine to indicate how the achievements of individual hygiene and clinical medicine can be made available to those who are unable individually and on the basis of their own means to take advantage of these achievements. Social medicine must provide physicians with the scientific tools that they need in order to be active in the fields of social insurance and social welfare. Finally, it must study the changes in the position of the medical profession, as well as the developmental trends that become apparent.

A survey of social medicine as it had developed in Germany prior to the First World War is contained in the collaborative volume.

[66] Teleky also points out that the effects of social conditions on health can be determined by 1) direct observation, and 2) with the help of statistics.

Krankheit und Soziale Lage edited by M. Mosse and G. Tugendreich which was published in 1913.[99] This book consists of three parts. The first is a general section dealing with history and statistics. The second section is devoted to the social etiology of disease, and the third to the social therapy of disease. In each section the chapters are contributed by individual authors who deal with some specific factor, such as housing, nutrition, occupation, or with a particular group of diseases—infectious diseases, venereal diseases, tuberculosis, nervous and mental diseases, neoplasms, dental diseases, alcoholism. Under social therapy the contributors discuss the influence of social legislation on the prevention, diagnosis and course of disease, the respective tasks of governmental and private agencies, and the control by the state of the social causes of disease.

On the whole, Mosse and Tugendreich follow the ideas of Grotjahn. But where the latter believed that social hygienic measures should culminate in eugenic action, the former regarded the equalization of life expectancy for all socio-economic classes as the goal of social medicine. They likewise designate statistical methods and materials as of the highest importance for the investigation and practice of social medicine, and devote a separate chapter to this topic.

The advance made in the theory and practice of social medicine in Germany up to the outbreak of the First World War is summed up in the statement of Adolf Gottstein: "Social etiology can now be regarded as accepted."[100] This opinion is strengthened by the fact that a number of significant books on social medicine appeared at this time. Some of these have been discussed above. Others were: Walter Ewald: *Soziale Medizin* (1911); A. Grotjahn and J. Kaup: *Handwörterbuch der Sozialen Hygiene* (1912); Adolf Gottstein: *Einführung in das Studium der Sozialen Medizin* (1913); L. Teleky: *Vorlesungen über Soziale Medizin* (1914).

Characteristic of all these authors, and of the fact that they were dealing with a relatively new field is the circumstance that the subject of research methods receives little attention. All agree on the

[99] M. Mosse und G. Tugendreich (editors): *Krankheit und Soziale Lage*, München, J. F. Lehmanns Verlag, 1913 (880 pp.).
[100] *Ibid.*, p. 722.

preeminent significance of statistical materials and methods. Fischer devotes a section to methods. Most of his discussion is concerned with statistics, but he goes on to mention that for specific problems the investigator may use methods taken from various social and other sciences. Among these are anthropometry, epidemiology, genealogy, sociology, economics, occupational technology, legal study, and in general health education and community organization.[101]

The period following the First World War did not add much to the theory of social medicine. Manuals and handbooks for medical administrators, students of social medicine, and practising physicians were published, but for the most part these did not concern themselves extensively with theory. The publication in 1932 of the *Grundriss der Sozialen Medizin* by Franz Ickert and Johannes Weicksel is noteworthy, for the first section of this work deals at length with the concept of social medicine.[102] This section was written by Ickert, and in defining the field of social medicine he divides it into four parts: social physiology and pathology, social diagnosis, social therapy, and social prophylaxis.

The meaning of these divisions is clarified by the subjects discussed under each. Under social physiology and pathology come the various aspects of income, nutrition, housing, and occupation. By social diagnosis Ickert comprehends a " case-work " type of approach in relation to health. Of interest is his reference to Mary Richmond's concept of social diagnosis which had been introduced into Germany by Alice Salomon. From this flow social therapy and social prophylaxis. The former comprises measures intended to make possible the achievement of medical therapeutic aims. These may be financial or social, and may be classified under the general headings of social welfare, social insurance, and attention to special groups such as the physically handicapped. Social prophylaxis includes legislative action in relation to housing and labor (labor legislation, safety measures, accident prevention), health education, physical education, and eugenics. Ickert was impressed by the

[101] Fischer, *op. cit.*, pp. 7-13 (see footnote 90).

[102] Franz Ickert and Johannes Weicksel: *Grundriss der Sozialen Medizin*, Leipzig, Johann Ambrosius Barth, 1932, p. 1 ff.

emphasis on health education in the United States, and urged the importance of action in this field.

In discussing the social relations between individual diseases and the environment, Ickert follows the six-point outline that Grotjahn had set up. As a fundamental basis for any work in social medicine he insists on a knowledge of statistics, and emphasizes the importance of statistical data for dealing with populations in terms of age, sex, morbidity, mortality and migration.

The concepts of social medicine developed in Germany, in particular the ideas of Grotjahn, had a wide influence on the theoretical development of this field in other countries, notably in Central and Eastern Europe. Noteworthy is the development of social medicine in Czechoslovakia.

The concept of social medicine as understood in Czechoslovakia may be illustrated by the definition given by Pelc in 1936.

> Medicine in its broadest sense [he said] is the science which studies the factors on which the health of man is based, as well as the means of maintaining, improving and promoting health. We consider social medicine as a discipline which permits us to recognize the physical and mental maladies of human groups, and to determine the means—almost always of a general nature—which enable us to treat and to control these diseases, and to improve the health status of human groups. In social medicine two fundamental aspects may be distinguished, one descriptive, the other normative.[103]

The scope of social medicine as envisaged by Pelc may be seen from the description of the course that he gave at the University of Prague.[104] This course was given over a period of two semesters at the Institute of Social Medicine in Prague. Two hours a week were devoted to theoretical lectures and three hours to practical demonstrations. The first semester covered social pathology and social hygiene, and dealt with the following topics: methods of statistical demography and their application in evaluating the physi-

[103] Pelc, *op. cit.* See above footnote 86.

[104] Hynek Pelc: Les méthodes d'enseignement de la médecine sociale à l'Université Charles à Prague, Reprint from *Bruxelles Médical* (no. 11), January 10, 1937. See also Hynek Pelc: Le problème de la création de l'Institut de médecine sociale près la Faculté de l'Université de Prague, Reprint from *Revue d'Hygiène et de Médecine sociale*, October 1936.

cal and sanitary condition of a population; health education; nutrition; housing; maternal and child health, and school hygiene; handicapped children; mental hygiene; control of tuberculosis and venereal disease; alcoholism and chronic illness; occupational hygiene. The second semester dealt with the organization of public health and curative medicine in Czechoslovakia under the following divisions: the hygienic and social organization of the country; hospital organization and administration; organization of the medical profession (including medical ethics); and social insurance.

Social medicine has also been extensively developed in the Scandinavian countries, the Soviet Union, Italy, France, Switzerland, Holland, Belgium and Yugoslavia. Thinking on social medicine in the Soviet Union was considerably influenced by the ideas of Grotjahn.[105] In general, developments in specific countries may be regarded as exhibiting specific characteristics due to conditions in the particular country.[106] Italians, for instance, have tended to emphasize the physiology and pathology of occupation; in France and Belgium attention has been focussed on the social hygiene of childhood, control of tuberculosis and venereal disease, and medical problems of labor. In Yugoslavia, under Andrija Stampár, the emphasis was on the problems of a rural population.

Social medicine in Belgium has an outstanding representative in René Sand, and it is of interest to present his concept of social medicine before turning to recent developments in Great Britain and the United States. In his book, *L'Économie humaine par la médecine sociale*, which appeared in 1934, Sand defines social medicine as "the preventive and curative art considered, both in its scientific foundations as well as in its individual and collective applications, from the point of view of the reciprocal relations which link the health of man to his environment."[107] He divides social medicine into the following subdivisions:[108]

1. *Social anthropology* is concerned with the study of physical and mental inequalities in different social classes.

[105] Grotjahn: *Erlebtes und Erstrebtes*, p. 270.

[106] René Sand: *L'Économie humaine par la médecine sociale*, Paris, Les Editions Rieder, 1934, pp. 11-13.

[107] *Ibid.*, p. 14.

[108] *Ibid.*, pp. 15-17.

2. *Social pathology* studies in the same classes variations in the incidence, course and outcome of disease, or in other words social inequalities of disease and death.

3. *Social etiology* seeks the causes of these differences in heredity and environment.

4. *Social hygiene*, which includes both social therapy and social prophylaxis, deals with the application of palliative, curative and preventive measures to diseases of social origin. In this, social insurance and occupational medicine play important parts.

Sand's concept of social medicine is broad, and it is important to note also the central rôle that the concept of social class plays in his view.

Interest in social medicine has developed slowly in Great Britain and the United States, and only recently has an awareness arisen of the need for formulation of a concept of social medicine. The social relations of health and disease had been recognized by physicians and laymen, but owing to a number of causes no concerted effort had been made to organize such knowledge on a coherent basis and thus make it available for practical application. In part this was due to the dominant rôle that laboratory sciences and techniques had come to play in medicine, in part to the concurrent rise and expansion of medical specialism, and in part to the limited view of public health that has been current in both countries. Furthermore, the bias created by these factors was reinforced by powerful social ideologies still rooted in the nineteenth century version of natural law.

During the past two decades, however, influences within medicine itself and in society as a whole have acted to overcome these obstacles. The development of psychiatry, of medical social work, and of various branches of medicine such as endocrinology and nutrition, tended to break down the compartmental thinking of the physician, and to bring back into mental focus the sick person, the patient. Moreover, within society as a whole the ideology of complacent individualism was wearing thin and consciousness of social problems, including those involving health, became exceedingly acute. The concept of the welfare state achieved articulate prominence

during the threatening 'thirties and culminated during the next decade in the famous Beveridge Report.

In Britain, various studies on social aspects of health and disease appeared during the 'thirties. Among these may be mentioned G. C. M. M'Gonigle and J. Kirby: *Poverty and Public Health* (1936); J. B. Orr: *Food, Health and Income* (1936); and R. M. Titmuss: *Poverty and Population* (1938). The subtitle of the last book—*A Factual Study of Contemporary Social Waste*—with its reference to the wastage of human lives, characterizes the point of view of most of these writers.

Another significant undertaking was the work of the Peckham Health Centre in London, which was started in 1926 by G. Scott Williamson and Innes H. Pearse.[109] At this institution the attempt was made to develop health as a positive social value on the basis of a fundamental social unit, the family. These workers defined health as the product of "a progressive mutual synthesis participated in by both organism and environment." Thus health is not a something that is passively acted upon by social conditions, but is the product of a functional dynamic process which is an integral part of a healthy social life.

By 1943, these ideas had advanced so far in Great Britain that an Institute of Social Medicine was set up at Oxford with John A. Ryle as the first Professor of Social Medicine. (The working life of this Institute began in the spring of 1944.) Some two years later F. A. E. Crew was appointed to a chair of social medicine at Edinburgh. It is therefore of considerable interest to see what concepts of social medicine have been put forth by Ryle and Crew.

In 1943, Ryle defined social medicine as embodying

> the idea of medicine applied to the service of man as *socius*, . . . with a view to a better understanding and more durable assistance of all his main and contributory troubles which are inimical to active health and not merely to removing or alleviating a present pathology. It also embodies the idea of

[109] For the story of the Peckham Health Centre and its work see I. H. Pearse and G. S. Williamson: *The Case for Action*, London, Faber and Faber, 1931; *Biologists in Search of Material. An Interim Report on the Work of the Pioneer Health Centre Peckham*, London, Faber and Faber, 1938; I. H. Pearse and Lucy H. Crocker: *The Peckham Experiment. A Study in the Living Structure of Society*, London, George Allen and Unwin, Ltd., 1943.

medicine applied in the service of *societas*, or the community of men, with a view to lowering the incidence of all preventable disease and raising the general level of human fitness.[110]

The *Annual Report* of the Institute of Social Medicine, published in 1945, contains a statement of the purposes of the Institute which may be regarded as representing Ryle's view of the scope of social medicine. This purpose is

> (a) To investigate the influence of social, genetic, environmental and domestic factors on the incidence of human disease and disability. (b) To seek and promote measures other than those usually employed in the practice of remedial medicine, for the protection of the individual and of the community against such forces as interfere with the full development and maintenance of man's mental and physical capacity.
>
> [In summary, then], Social medicine is a comprehensive term. It may, in fact, be held to include the whole of the public and industrial health services, the social services and the remedial services of a community. But just as clinical medicine may be considered not only in terms of "medical practice," but also as an "academic discipline," so too may social medicine be considered. Its observations and researches are in connection with groups or populations rather than with individuals. It requires different methods and collaborations. . . . Social pathology is the related science of social medicine. . . . The problems of social pathology must be sought in the field.

As methods to be used for expanding the knowledge of social medicine, Ryle lists: 1. statistical studies of morbidity and mortality; 2. the socio-medical survey; and 3. the social experiment (this refers to studies such as that of M'Gonigle and Kirby (1936) mentioned above.

Recently (March 7, 1947), at the centennial celebration of the New York Academy of Medicine, Ryle spoke on "Social Pathology and the New Era in Medicine."[111] In this address he characterized social medicine, in contradistinction to public health, as "deriving its inspiration more from the field of clinical experience and seeking always to assist the discovery of a common purpose for the remedial and preventive services, places the emphasis on man, and endeavors to study him in and in relation to his environment."

[110] John A. Ryle: Social Medicine: Its Meaning and its Scope, *British Medical Journal*, Nov. 20, 1943, vol. II, p. 633.

[111] "City Seen as Heart of Medical World," *New York Times*, March 7, 1947.

In social medicine the environment is extended to include

> the whole of the economic, nutritional, occupational, educational, and psychological opportunity of experience of the individual or of the community. . . .
>
> Social medicine is concerned with all diseases of prevalence, including peptic ulcer and chronic rheumatic diseases, cardiovascular disease, cancer, the psychoneuroses and accidental injuries—all of which have their epidemiologies and their correlations with social and occupational conditions and must ultimately be considered to be in greater or less degree preventable.
>
> [Finally, social medicine] properly takes within its ambit the whole of the work of a modern social service department. This includes social diagnosis and social therapeutics—the investigation of conditions, the organization of after-care and the readjustment of the lives of individuals and families disturbed or broken by illness. The almoner or medical social worker also has an important part to play in teaching and in the follow-up activities of a clinical research unit.

The remarks on social medicine published by Crew in 1944 add nothing to the views set forth by Ryle.[112] In January, 1947, there appeared the first issue of the *British Journal of Social Medicine*, edited by F. A. E. Crew and Lancelot Hogben. The editors define social medicine as

> that branch of science which is concerned with: (a) biological needs, interactions, disabilities, and potentialities of human beings living in social aggregates; (b) numerical, structural, and functional changes of human populations in their biological and medical aspects. To a large extent its methods must necessarily be statistical, involving the use of numerical data obtained either from official sources or from special field investigations, and interpreted in the light of established findings of the laboratory and of the clinic. Social medicine takes within its province the study of all environmental agencies, living and non-living, relevant to health and efficiency, also fertility and population genetics, norms and ranges of variation with respect to individual differences and, finally, investigations directed to the assessment of a regimen of positive health.[113]

While these British developments are no doubt of great interest and hold considerable promise for the future, the conceptual ap-

[112] F. A. E. Crew: Social Medicine. An Academic Discipline and an Instrument of Social Policy, *Lancet*, November 11, 1944, p. 6.

[113] *British Journal of Social Medicine*, Vol. 1, no. 1., January 1947. The definition quoted is to be found in the "Notice to Contributors" on the back of the cover.

paratus of the authors quoted above does not yet seem to be as well developed as that of the German writers previously discussed. Although the word "social" is used repeatedly, there is no effort to define precisely what is meant by "social." Thus in one statement social medicine is "to investigate the influence of social, genetic, environmental and domestic factors on the incidence of human disease and disability," while another statement defines environment to include "the whole of the economic, nutritional, occupational, educational and psychological opportunity of experience of the individual or of the community." Clearly if the environment is defined as broadly as it is here it will also include social and domestic factors. And if it does not include them then social and domestic factors must be clearly defined. By comparison, however, with the definition advanced by the editors of the *British Journal of Social Medicine*, the concepts of Ryle are models of clarity. The former is a catch-all, apparently intended to accommodate all sorts of studies that have something to do with mass aspects of health and disease.

Furthermore, despite the frequent use of the word social, the statement by Crew that "social medicine is rooted both in medicine *and in sociology*" [italics mine, G. R.], and that "it includes the application to problems of health and disease of sociological concepts and methods," the bias of such studies as have been published seems still to be clinical and statistical. It still remains to be seen to what extent the British workers will actually utilize sociological concepts and methods for the exploration of specific problems; and whether they will endeavor to see how the available knowledge of the social sciences can be put to use to improve health. For the present it is significant, however, that in 1945 the Institute of Social Medicine at Oxford had a medical social worker on its staff, but no social scientist (sociologist, anthropologist or economist).

The trend toward the development of a concept of social medicine in the United States, as in Great Britain, is a recent phenomenon. Physicians had long been aware in a general way of the social relations of medicine. Daniel Drake in his *Discourses* pointed out that: "Medicine is a physical science, but a social profession. What skeletons are to the comparative anatomist, and plants to the botanist, people in health and disease are to the physician. Both his elemen-

tary studies and his after duties are prosecuted in their midst and can be pursued nowhere else." At the same time some laymen were aware that public necessity could well require state action to provide social services. Abraham Lincoln, for instance, in 1854 quoted with approval Jefferson's statement that a legitimate object of government is " to do for the people what needs to be done, but which they cannot by individual effort, do at all, or do so well, for themselves."

The roots of social medicine in the United States are to be found in organized social work which emerged out of organized charity during the 'nineties of the last century.[114] It was here that medicine and social science found a common ground for action—in the prevention of tuberculosis, securing decent working conditions in factories, better housing, and the like. It was also as a part of this trend that Richard Cabot in 1905 introduced medical social service. (The term " medical sociology " was first used in 1902 by Leartus Connor in America, and by Elizabeth Blackwell in England.)

Out of this background Francis Lee Dunham in 1925 tried to develop a concept of social medicine.[115]

> Whether as a separate field or as an adjunct to other fields [Dunham wrote], Social Medicine has a clearly defined function—social here referring to the problem's public character, and medicine to the knowledge and practice of welfare. Defined, its purpose is to further the application of scientific methods, of organization to man's social habits in order to determine their usual biological characteristics, to discover the sources, causes and effects of instability and to establish a sympathetic equilibrium between the organism's innate and acquired tendencies.[116]

Basic to the origin of this concept, according to Dunham, was the need in welfare work " for a field of preventive medicine to which social science, psychology, psychiatry and various other de-

[114] See Edward T. Devine: *When Social Work was Young*, New York, Macmillan Company, 1939; Alice Hamilton: *Exploring the Dangerous Trades*, Boston, Little, Brown and Company, 1943, pp. 53-117.

[115] Dunham, a psychiatrist, was Lecturer on Social Medicine at the Johns Hopkins University. He gave a course to students of social economics in the clinical study of the personality.

[116] Francis Lee Dunham: *An Approach to Social Medicine*, Baltimore, Williams and Wilkins Company, 1925, p. 30.

partments shall contribute but upon none of which shall the entire burden of responsibility fall. Such a field functions more naturally as an attitude, a point of view, rather than as a specific department. It may be called *Social Medicine* and its technic *An Approach to the Field of Social Medicine*." Furthermore, " destitution and sickness are old companions and since the former is so often the result of the latter the continued administrative separation of the two problems of poverty and sickness . . . is inconsistent with official responsibility." [117]

In defining the scope and function of social medicine, Dunham put the emphasis on social and personal adjustment. Social medicine, he said, helps to harmonize human behavior and to organize conduct.

> [It] attempts to bring about a harmonious organization between personal tendencies and their surroundings. Definite departments of Social Medicine include various agencies dealing with the family as a neighborhood unit, with the interests of infancy, childhood, and youth; with educational and industrial hygiene in its relation to conduct, with the administration of justice through courts of law; with punitive and corrective institutions and with other social phenomena. General and Preventive Medicine are more strictly analytical fields from whose data Social Medicine seeks to synthesize or construct an adequate social adjustment.[118]

The approach of Dunham is markedly influenced by the biological and social thought of the period. The eugenic approach is clearly evident, and the shadow of William Graham Sumner still falls on this pioneer American attempt to formulate a concept of social medicine.

Similar ideas were expressed by a few other physicians at this time. Lewellys F. Barker commented in 1926 in this sense on broadening conceptions of the task of the practising physician.[119] Yet these attempts remained stillborn. It may well be that the almost exclusive concentration of the economic aspects of medical care, which began with the work of the Committee on the Costs of Medical Care militated against the development of a theory of social medicine.

[117] *Ibid.*, pp. 14-15.

[118] *Ibid.*, p. 20.

[119] Lewellys F. Barker: Comments on Health and Life, and on Broadening Conceptions of the Tasks of Practising Physicians, *Annals of Clinical Medicine* IV: 525-534, 1926.

One might expect that the advent of the depression with its profound effect on the health of the unemployed and their families might have turned the minds of some in this direction. Nevertheless, with one outstanding exception this was not the case. The exception was Edgar Sydenstricker, who, in 1933, brought out his study on *Health and Environment*. In this monograph, he carried out a masterly analysis of the idea of environment into its component aspects, and then showed the relation of each of these to health problems. Sydenstricker thus laid the basis for a theory of social medicine, but unfortunately he never went on to develop such a theory.

Sporadic references to social medicine during the 'thirties are to be found. In 1937, Gertrud Kroeger presented a survey of the development of the concept of social medicine in Germany.[120] Michael M. Davis in 1938 called the attention of sociologists to social medicine as a field for research.[121] In 1940 Joseph Hirsh and Elizabeth G. Pritchard reporting on a survey of the teaching of social medicine in liberal arts colleges and universities gave the following definition of social medicine.[122]

> Since current public health and medical problems have their roots in the evolutionary changes which have occurred in many and diverse fields of thought and action, the term "social medicine" has been adopted to designate a total concept of the social, economic, and psychological problems which affect the health of man . . . "social medicine" refers to the economic, social, and psychological problems of public health and medical care, including collective attempts to solve them through public health legislation, tax-supported medical care, voluntary and compulsory health insurance; medical institutions and organizations; and the history of public health and medicine in relation to society.

The importance of a concept of social medicine has been repeatedly emphasized by Henry E. Sigerist. In his proposed plan for a new medical school, published in 1941, the place of social medicine in the curriculum was recognized. In 1945, Sigerist again called atten-

[120] See footnote 26.

[121] Michael M. Davis: Social Medicine as a Field for Social Research, *American Journal of Sociology*, XLIV: 274-279, 1938.

[122] Joseph Hirsh and Elizabeth G. Pritchard: Teaching of Social Medicine in Liberal Arts Colleges and Universities, *Public Health Reports* 55: 2041-2060, 1940.

tion to the important rôle that the social sciences have to play in the medical school, and pointed out that "Social medicine is not so much a technique as rather an attitude and approach to the problems of medicine," which no doubt "will some day permeate the entire curriculum." [123]

The need for a conceptual formulation, a theory, of social medicine is gaining recognition in the United States at present. In support of this contention one may cite the publication of such studies as Henry B. Richardson's *Patients Have Families* (1945), the three-day Institute on Social Medicine (March 19-21) held as part of the centennial celebration of the New York Academy of Medicine, and the recent article of Winslow Carlton on the problem of social medicine.[124] According to Carlton,

> The restoration of medicine as a social institution to a state of equilibrium within itself is a job crying for the participation of the most highly qualified physicians. Thus far, leaders in the profession of medicine have taken an active part in only a few communities; leaders in the business of medicine have taken rather too great a part. Why is this not a subject for the medical schools? It is as much a matter of concern to medicine as foreign policy is to government. Statesmanship is needed, and where else should one look than to the medical schools?
>
> What is required is the creation of a new discipline within medicine—it might properly be called "social medicine," which would concern itself with the relation of the medical arts and sciences to society. It is not a subject to be handled as an extracurricular activity at occasional institutes and conferences; it demands the same kind of concentrated attention and experts as any major field of investigation and practice. Training in medical administration will not answer, useful though administrators would be, for something worth administering is necessary. Nothing less than an organized staff of men and women working in the community, observing medical conditions with painstaking care, consulting the experience of representative people, examining the results of local medical plans and interpreting their findings as scientists will produce sound answers to the fundamental questions at issue.

From these specimen definitions, it is evident that American

[123] Henry E. Sigerist: *The University at the Crossroads*, New York, Henry Schuman, 1946, p. 130; see also pp. 106-126.

[124] Winslow Carlton: The Problem of Social Medicine, *New England Journal of Medicine* 236: 496, 1947.

thought on social medicine is in a fluid condition. Much of the thinking is still too vague and fuzzy to be of practical value. Goethe said, *Die Geschichte der Wissenschaft is die Wissenschaft selbst*, and if he was right the genetic analysis of the concept of social medicine that we have attempted can contribute to a better understanding of the complex problems of this field by providing a point of departure for further exploration.

V.

What is Social Medicine?

Historically, the appearance of a concept of social medicine has occurred in response to problems of disease created by industrialism. To a very considerable extent the history of social medicine is also the history of social policy (welfare). Concerned at first primarily with the new class of industrial workers and their problems, social medicine can today be conceived in a broader sense to include various social groups.

Based on the twin pillars of medicine and social science, the concept of social medicine could become more precise only with the advance of medicine and the development of social science. One cannot emphasize sufficiently that social medicine rests equally upon the social *and* the medical sciences. Anthropology, social psychology, sociology and economics are as important for this field as the various branches of medicine.

Fundamental to a concept of social medicine is its concern with what is true of the health of man by virtue of the fact that he leads a group life. In the light of this concern social medicine has two broad aspects: 1) descriptive and 2) normative. As a descriptive science it investigates the social and medical conditions of specific groups, and establishes such causal connections as exist between these conditions; as a normative science it sets up standards for the various groups that are being studied, and indicates measures that might be taken to relieve conditions and to achieve the standards that have been advanced.

The scope of social medicine may also be delimited in terms of

three significant sociological aspects: 1) health in relation to the community, 2) health as a social value, and 3) health and social policy.

In terms of the community, social medicine is concerned with the relation of health and disease to community institutions, to population movements within large communities (that is, the invasion and succession of different population groups in specific areas), to the racial and ethnic patterns of communities, to standards of living, and to the social and economic status of different groups.

In considering health as a social value, the point of interest would be to know how this value has been defined by various social groups, the nature of the desires and expectations of different groups in respect to health, and the extent to which these ends are achieved or frustrated. Naturally, this involves an understanding of the hierarchy of values in our society, and of the place which health as a value occupies in different social classes. It will be immediately apparent that knowledge of this type has fundamental implications for such fields as medical care, nutrition, and health education.

Research which will contribute to the formation of social policy is the third major aspect of social medicine. To begin with, attention might be turned to the problem of how far legislation keeps pace with increasing knowledge of the relations between health and other aspects of social life. It is known that standards and measures once accepted tend to acquire vested interests and may become obstacles to further progress. The investigations of such lags would be of considerable interest for it would undoubtedly throw light on the power relationships between pressure groups, and the influence which they exert in legislative bodies in matters of health and welfare. Furthermore, the development of concepts of public responsibility in relation to matters of health for various socio-economic groups also falls under this head.

The concept of the social group, or more specifically of the social class, is basic to social medicine. It is therefore concerned not with the individual *per se*, but with the individual as a member of a group, of a certain economic group, or more broadly as a member of a social group, who because of this membership is exposed to various external influences deleterious to his health, influences and factors

that occur exclusively, predominantly, with special intensity, or in peculiar form in his social group and are closely linked to the economic status of this group. Consequently, it is the purpose of social medicine to study all the factors that make up the social condition of a particular group, and that affect the health status of any members of this group; and on the basis of this knowledge to propose such measures of a medical, sanitary or social nature as are necessary to improve health and to make available to the people in the greatest possible degree the achievements of science in the prevention and treatment of disease.

The further development of social medicine requires also that those concerned with this subject devote attention to the achievement of greater conceptual precision. There is a definite need for more precise definition of terms, and for some agreement on the way in which certain terms will be used. There should be some understanding of what is meant by the adjective "social." It must be made clear that social does not mean environmental. Environment is a much broader term, of which the social is only one aspect.[125] The concepts of social science—for instance, social structure, institution, social organization and disorganization—must be examined to determine how useful they can be in dealing with problems of health and disease. In general, Adolf Meyer's pattern of inquiry based on critical common sense will probably be most useful: "What is the fact? The conditions under which it occurs and shows? What are the factors entering and at work? How do they work? With what results? With what modifiability?"[126]

On methods of research and application not very much need be said. Statistical methods and materials will of course play an important part, but social medicine as a synthetic science will make use of any methods that may be necessary or appropriate to the problem in hand.

Finally, important aspects will be the determination of ways and

[125] R. M. MacIver: *Society. A Textbook of Sociology*, Farrar and Rinehart, 1937, p. 102.

[126] Adolf Meyer: Spontaneity, in *A Contribution of Mental Hygiene to Education*, Program of the Mental Hygiene Division of the Illinois Conference on Public Welfare, Chicago, 1933.

means of teaching the subject to medical students and of making the knowledge acquired available to medical practitioners. In this connection it will be important to determine the rôle of the practitioner in social medicine.

We live today in a world of complex social, economic and political organization. To deal most efficiently with problems of health and disease in this world, the development of social medicine will be a necessary condition. It is as a modest contribution toward that end that this survey is presented.

EARLY AMERICAN ANIMALCULAR HYPOTHESES

PHYLLIS ALLEN

The hypothesis that minute microscopic animals might be a cause of disease is an old one. It was put forth by certain ancient Romans, revived again in late medieval times, adopted by a scattering of scientists in early modern times, and eventually justified by the work of Pasteur and Koch. One of the most significant periods in the development of this idea was the early nineteenth century. During the 1840's there was a definite animalcular school of thought in both Europe and America. In Europe the hypothesis was gradually developed by first one hand and then another until it culminated in the germ theory of disease. In America the number of animalculists reached a peak in the late 1840's and then declined, giving way to the miasmatists. By 1875, when European ideas on this subject once more began to receive attention, they were treated as something entirely novel. The work of earlier American animalculists was practically forgotten and scarcely a writer mentions one of them.

Who were these early animalculists in America? What were their ideas? How were these ideas received by their contemporaries? The answers to these questions illustrate a forgotten but interesting side of American medical history.[1]

The earliest American animalcular hypothesis appears to have been that of John Crawford of Baltimore, who published his ideas in a series of articles in a literary magazine, *The Observer and Repertory*, published by his daughter in 1807. Crawford may have been influenced by European animalculists, such as Benjamin Marten, Sir Richard Blackmore and James Tytler,[2] but his theory bears little resemblance to theirs. By drawing upon analogies in nature he developed the thesis that disease " must be occasioned by eggs insinu-

[1] For a fuller discussion, including the contemporary scene and European ideas, see Phyllis Allen, " Etiological Theory in America Prior to the Civil War," *Journal of the History of Medicine and Allied Sciences*, II, July, 1947.

[2] Benjamin Marten, *A New Theory of Consumptions* (London, 1722); Sir Richard Blackmore, *A Discourse Upon the Plague* (London, 1721); James Tytler, *A Treatise on the Plague and Yellow Fever* (Salem, 1799).

ated, without our knowledge, into our bodies." [8] He believed that these deposited eggs developed into parasites, which, like the eggs of the ichneumon fly, grew at the expense of the host. This theory was repeated in an *Introductory Lecture* published in 1811, which was later cited by an anonymous reviewer in 1828. Aside from this reviewer, Crawford seems to have attracted little attention among his contemporaries. To most physicians his ideas would have been pure heresy. At that time miasmata were accepted as the proper causation in a multiplicity of diseases, although the current controversy between the contagionists and the non-contagionists (in regard to fevers) produced other suggestions,—factors such as atmospheric conditions, chemical and physical causes, electricity, gases and mineral exhalations.

The second animalcular hypothesis was suggested by a man whose name unfortunately is unknown. An anonymous reviewer in the *American Quarterly Review* for 1828 introduced a well-defined animalcular theory into a review of John McCulloch's book on malaria. Nothing can be deduced about the author of the review beyond the fact that he was a Philadelphian. The text of the review itself at first seemed to favor the ideas of McCulloch. Then suddenly the author announced that he was not satisfied with McCulloch's gaseous theory of the causation of the disease, and he developed thirty-two arguments to show why an animalcular hypothesis fit the facts in a much more satisfactory manner. The terminology of this animalculist (and most others) is confusing, because he used the word "insect" to mean "animalcule," and the parasitic origin of disease is all mixed up with the idea of insect transmission, to the confusion of both. The anonymous reviewer describes his "insects" in the following terms:

> Insects are of all sizes, from the largest to the myriads of various kinds, which nothing but the most powerful microscope can exhibit to our sight. But large or small the laws of their production are the same. The circumstances that will produce a gnat, will produce an insect something less; and so on till we come to the animalculae infusoriae, and those that float on the atmosphere. Animalculae and miasmae are connected then: always in time, place and circumstance. . . . Does any man doubt that we inhale animalculae when we

[8] Palmer H. Futcher, "Notes on Insect Contagion," *Bulletin of the Institute of the History of Medicine*, IV, No. 7, 552.

breathe: that we eat them and drink them? That when our constitution is vigorous, we destroy and assimilate them, and that when their constitution is more vigorous than ours, they live upon us, at our expense? [4]

The anonymous reviewer had a negative influence upon Usher Parsons of Brown University, who, though he included the animalcular theory in his work, rejected it in favor of the idea that disease was caused by the miasma arising from decomposing vegetable matter.[5] Parsons, unfortunately, made so many diseases attributable to miasmata from decaying vegetation that he almost defeated his own argument. Even before research in pathological anatomy came to America, authors such as Noah Webster, and Edward Miller had found it necessary to differentiate between miasmata in order to account for the great difference in fevers.[6] After pathological anatomy arrived, the fact that the various fevers were shown to be clinical entities made differentiation imperative, as appears in the work of David Hosack, J. M. Smith, and the encyclopedia makers, Copland and Williams.[7]

The celebrated midwestern doctor, Daniel Drake, had an interesting animalcular theory. In his *Practical Treatise on the History, Prevention and Treatment of Epidemic Cholera*, published in 1832, he listed seven possible theories to explain the immediate causes of disease, and indicated that he preferred the animalcular hypothesis to all others. His reasoning in regard to the action of invisible life is interesting:

As to the manner in which the supposed aerial *animalculae* might act on, or enter the human body, it may be the same, as that in which contagion, or

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[4] Anonymous, Art. II, "Book Review," *American Quarterly Review*, IV, 303-4.

[5] Usher Parsons, *On the Comparative Influence of Vegetable and Animal Decomposition as a Cause of Fever* (Philadelphia, 1830), 11.

[6] Noah Webster, *A Brief History of Epidemic and Pestilential Diseases* (London, 1800), II, 338 ff.: Edward Miller, *The Medical Works of Edward Miller, M.D.*, ed. Samuel Miller (New York, 1814), 183-202.

[7] David Hosack, *Observations on the Laws Governing the Communication of Contagious Diseases and the Means of Arresting their Progress* (New York, 1815); J. M. Smith, *Medical Works*, 196, quoted extensively in Copland; James Copland, *A Dictionary of Practical Medicine* (New York, 1845), II, 556-70, III, 1130-31, IV, 404-5n; *The Encyclopedia of the Medical Sciences* (London, 1847), section on principles of medicine by Robert Williams, 820. See also John Mason Good, *The Study of Medicine* (New York, 1835), I, xv-xvii, 334-44.

malaria—admitting its existence—exerts itself. The *ova* of such insects may even be deposited and float in the air, to fall into the water and be hatched out, as the seeds of many of the most imperfect plants . . . are disseminated; and these *ova*, as well as the perfect insects, may be inhaled or swallowed, and adhere to the mucuous membrane, or perhaps be absorbed into the blood or both; or, the *ova*, being deposited in the waters, may be swallowed, and the insects developed in our bodies.[8]

Considering what was then known about the proximate causes of fevers, Drake's idea seems quite advanced, in spite of limited and ambiguous terminology. He later elaborated his views in his famous *Diseases of the Interior Valley of North America,* giving fourteen logical arguments for believing in a " vegeto-animalcular hypothesis." During this period questions were still settled by logic in preference to experiment.

Following Drake's work in 1832, there was a lapse of about fifteen years, during which other theories, particularly chemical and atmospheric ones, occupied the attention of the physicians. Then, between 1847 and 1849, three important animalcular theories appeared. The first was that of George B. Wood of the University of Pennsylvania. Wood, in his textbook, *A Treatise on the Practice of Medicine,* spoke in favor of animal or vegetable germs as a cause of disease, especially yellow fever, rather than a ferment, the chemical theory presenting the most plausible alternate possibility. He clearly grasped the place of the microscope in solving the problems of etiology. Wood, however, appears to have accepted the theory of spontaneous generation and, with the germ theory, this makes an interesting combination, which was often repeated.[9]

A more definite animalculist was Josiah Clark Nott of Mobile, who, in 1848, discussed the cause of yellow fever in the *New Orleans Medical and Surgical Journal.* Nott considered that contagious diseases were caused by germs, and he made some attempt to carry over this idea into the realm of fevers. In the case of malaria, he thought that " some insect or animalcule . . . like the mosquito "

[8] Daniel Drake, *A Practical Treatise on the History, Prevention and Treatment of Epidemic Cholera* (Cincinnati, 1832), 47.

[9] George B. Wood, *A Treatise on the Practice of Medicine* (Philadelphia, 1847), 147.

might be involved.[10] He supported his theory of the insect origin of disease by referring to the current idea that "the morbific cause of Yellow Fever" was more active at night, saying:

> Many of the Infusoria, as well as insects proper, are rendered inactive by too much light, heat or dryness. They remain quiet during the day and do their work at night. This fact is too familiar to require illustration. The moth tribe, the night musquitoes, many of the aphides, &c. are familiar examples.[11]

In conclusion, Nott hints at an analogy between parasites in plants and parasites in man, but this part of his work lacks clarity. The weakness of Nott's theory is that when he said "insects" he meant insects and not, as most animalculists, a different species of microscopic animals. He did not, as Drake, consider what the actual effect of these insects on the human body would be, and so there is no way of discovering whether he considered the poisonous bite of the insect more significant or its eggs. It is unlikely that he considered the insect merely as a carrier.

The best known American theory of the animalcular school was that of John K. Mitchell of Jefferson Medical College, who published *The Cryptogamous Origin of Malarious and Epidemic Fevers* in 1849. Mitchell believed that a spore-producing fungus was the cause of disease. Noting the presence of gangrene in many illnesses, and adding it to others where it does not appear, he attributed this condition to the action of a fungus. He was aware of the connection between dampness and fungi, and he applied this link to diseases such as malaria and yellow fever, which seemed to flourish at night and in wet weather. He thought the fungus spores could be swallowed, especially in the case of typhoid fever, producing gangrene inside the intestines.

Mitchell's cryptogamous theory had wide influence. Joseph Leidy, the famous parasitologist, opposed it because he himself had swallowed large quantities of infusoria without ill effects. Réné La Roche also rejected it because of his respect for the opinion of Leidy.

[10] Josiah C. Nott, "Yellow Fever Contrasted with Bilious Fever—Reasons for Believing It a Disease sui generis—Its Mode of Propagation—Remote Cause—Probable Insect or Animalcular Origin, &c.", *New Orleans Medical and Surgical Journal*, March, 1848, 580.

[11] *Ibid.*, 581.

Drake, on the other hand, hailed the theory as "almost irresistible," as did many others, at home and abroad.[12] When the theory was reviewed in the *Southern Quarterly Review* by R (possibly Richards, the editor) in 1850, the reviewer checked Mitchell's conclusions against the latest developments in the field of mycology, and found them completely satisfactory.[13] In 1876 and 1888, when later writers were enumerating forerunners of the germ theory of disease, Mitchell was the only American mentioned.[14]

A New York physician, Alexander H. Stevens, in 1850, speculated on the causes of cholera and suggested that animalculae or seeds of fungus might be at fault.[15] By this time the views of European animalculists, such as Charles J. B. Williams, Henry Holland, and J. G. Millingen, had received some attention in America and one would expect to find that the animalcular hypothesis had become more popular. Unfortunately this was not the case, and only three or four animalculists have been found in the period following 1850.

Two of these animalculists appeared in 1855, one a physician and the other a layman. M. L. Knapp of Illinois decided that the "assumed miasmata must be animalculae . . . a sort of animal stream or invisible quintessence of *suspected* animal life, well enough proved by its odor and poisonous effects, the fevers, as also by its being killed by the frosts, though never yet isolated or seen by mortal eye aided by the microscope."[16] Knapp thought it possible that the invisible matter might be either animal or vegetable. However, he also advanced another theory to the effect that most miasmatic dis-

[12] Réné La Roche, *Pneumonia: Its Supposed Connection Pathological and Etiological with Autumnal Fevers* (Philadelphia, 1854), 319-20 n; Daniel Drake, *A Systematic Treatise Historical, Etiological and Practical of the Principal Diseases of the Interior Valley of North America* (Cincinnati, 1850), II, Pt. I, 727 n. Others were Francis Peyre Porcher, E. S. Gaillard, John Evans, O. B. Knode, William S. Tingley, M. L. Knapp and Alfred Stillé.

[13] *The Southern Quarterly Review*, New Series, I, 151.

[14] Austin Flint, "Medical and Sanitary Progress," *Harper's Magazine*, No. CCCXIII, Vol. LIII, June, 1876, 83; Ezra M. Hunt, "Notes on Progressive Studies in Etiology," *Medical News* (Philadelphia), Mar. 17, 1888, Vol. LII, No. XI, 281.

[15] Alexander H. Stevens, "On the Communicability of Asiatic Cholera," *Transactions of the Medical Society of the State of New York*, No. 174, Albany, 1850, 34.

[16] M. L. Knapp, *Inquiry into the Nature of the Nursing Sore Mouth Affection* (n. p., 1856), 251-2.

eases were caused by deficient nutrition. He mentions curing cases of "malaria" with oranges, lemons, and fresh vegetables.[17] This is an interesting reflection on the diagnosis of the day.

The layman was J. Franklin Reigert of Lancaster, Pennsylvania, who had the idea that cholera was caused by very small yellow flies which he found in the spout of the town pump. Reigert uses the words "flies" and "animalculae" indiscriminately, but it is interesting to note that he connected them *through water* with cholera. He left it to the doctors to solve the problem of how the poisonous flies did their work, favoring both the possibility of their biting or of being swallowed by their victims.[18]

It is interesting to note that in the official *Report on the Origin of Yellow Fever in Norfolk*, released in 1857, both the majority and the minority opinions favored minute living organisms as the cause of fever,—"some organic matter endued with the property of rapid reproduction."[19] The majority believed that the organisms were not capable of reproduction in the human system, while the dissenter, Dr. A. B. Williman, held that the germ was contagious. In this case we find that the animalcular hypothesis has been accepted, while the old contagion controversy was continued. These men were the last full-fledged animalculists to appear until well after the Civil War.

In addition to these *confirmed* animalculists, there were several men who might be termed "near-animalculists." The earliest of these may have been Samuel Bard, who wrote to David Hosack in 1808:

> Your first class of contagious diseases is strictly and clearly defined; they can be communicated by contact only: is not the materies morbi of these diseases always generated within the body; and whether it consists of animalculae, or a chemical mixt, are they to be found anywhere else?[20]

In this case the animalcular hypothesis was secondary to the idea of contagion.

[17] Knapp, *Discovery of the Cause, Nature, Cure and Prevention of Epidemic Cholera* (Cincinnati, 1855); *Inquiry into Sore Mouth Affection*, 226-7.

[18] J. Franklin Reigert, *A Treatise on the Cause of Cholera: An Interesting Discovery* (Lancaster, Pa., 1855), 15.

[19] *Report on the Origin of the Yellow Fever in Norfolk* (Richmond, Va., 1857), 43.

[20] Hosack, *On the Laws of Contagion*, Additional Notes, 83. Letter from Bard to Hosack, Hyde Park, July 27, 1808.

Samuel Latham Mitchill of New York was an unintentional animalculist. He translated Giovanni Maria Lancisi's *De Noxiis Paludum Effluviis* in 1818 and published it by installments in the *Medical Repository*. Naturally Mitchill's translation included all of Lancisi's views on the animalcular hypothesis and insect transmission. These views made no impressions on Mitchill himself, who concentrated his energies on "satanic septon." In spite of the fact that Lancisi's ideas were available in translation, they were widely misinterpreted. Charles Caldwell wrote that the ancients had had an animalcular hypothesis and "Lancisi had only to exchange the generation of poison animalculae by putrefaction for the generation of a poisonous gas, and his work was done." J. K. Mitchell listed Lancisi as a firm believer in miasma, and so did M. L. Knapp. In view of the fact that any of these men could have read Mitchill's translation in the *Medical Repository*, it is difficult to see how they arrived at such conclusions unless they took their information at second hand from some erroneous source.[21]

Samuel Jackson of Philadelphia was another near-animalculist. Jackson was interested in experiments made by Dr. Benjamin Rush Rhees in 1820, in which he examined the black vomit of yellow fever victims with a solar microscope and found "innumerable quantities of animalculae" in it. Jackson remarked, "These very curious observations require to be further and more extensively prosecuted, and diversified, in order to ascertain what relation those animalculae possess with regard to the disease, either as cause or effect." [22]

In 1847, twenty-six years later, Elisha Bartlett mentioned the animalcular hypothesis as the best possible solution to the mystery of the cause of fevers, but he emphasized that it was still pure conjecture, and adoption should wait for proof.[23]

[21] S. L. Mitchill, "A Translation from the Latin, of the Celebrated J. Mar. Lancisi's Work, De Paludum Effluviis," *The Medical Repository*, New Series, IV, 1818, Appendix; Charles Caldwell, *Essays on Malaria and Temperament* (Lexington, Ky., 1831), 58; Mitchell, *The Cryptogamous Origin of Malarious and Epidemic Fevers* (Philadelphia, 1849), Lecture I; Knapp, *Inquiry into Nursing Sore Mouth Affection*, 226-7.

[22] Samuel Jackson, *An Account of the Yellow or Malignant Fever as it Occurred in the City of Philadelphia in 1820* (Philadelphia, 1821), 81.

[23] Elisha Bartlett, *The History, Diagnosis and Treatment of the Fevers of the United States* (Philadelphia, 1847), 480.

Alfred Stillé was much more positive in 1848. In his textbook on pathology, he explained that the incubation period in disease might be due to the development in the body of animal ova or vegetable germs. However, he cautiously added:

> When the microscope shall have revealed the existence of either of these sorts of bodies in the fluids through which inoculable diseases propagate their kind, it will be time to give the hypotheses in question a serious consideration.[24]

At the third National Quarantine and Sanitary Convention held in New York in 1859, Dr. John Watson of New York brought up the old idea that fomites might carry "the morbid agent or virus" of a disease from place to place. Dr. Alexander Stevens concurred with this view, but withheld agreement when Watson went on to say that in some cases human beings might act as fomites.[25] This same idea had been advanced by Henry Holland in 1839, but the concept of the intermediate agent, whether a human carrier or an insect, was very slow in coming.

Francis Peyre Porcher of Charleston, who worked carefully with the microscope, was close to an animalcular hypothesis in 1861 when he wrote: "Scarlet fever, measles, small-pox, are each *sui generis*, are disseminated by exposure to special morbid poisons, working in the system after the nature of a ferment, and which are peculiar in their nature." [26] This is a cautious agreement with a much earlier idea of Jacob Henle.

A few scientists mentioned the animalcular hypotheses in passing, but did not accept any of them.[27] Most men seem to have been totally oblivious of the fact that these alternate solutions to the problems of causation existed, or else they dismissed such ideas as absurd. Though European influence on American medical theory was strong,

[24] Alfred Stillé, *Elements of General Pathology* (Philadelphia, 1848), 104-5.

[25] *Proceedings and Debates of the Third National Quarantine and Sanitary Convention* (New York, 1859), 231-2; Henry Holland, *Medical Notes and Reflections* (Philadelphia, 1839), Ch. XXXIV, 255.

[26] Porcher, *Illustrations of Disease with the Microscope* (Charleston, S. C., 1861), 79.

[27] Joseph Leidy, *Flora and Fauna within Living Animals* (Washington, 1853), 14-15; La Roche, *Pneumonia and Malaria*, 318; J. W. Heustis, "Remarks on the Endemic Diseases of Alabama," *Americal Journal of the Medical Sciences*, II, 1828, 32-33; Parsons, *Comparative Influence*, 11; Caldwell, *Essay on Malaria*, 197.

and though the animalcular theories became increasingly important abroad,[28] this part of intellectual medicine seems to have made little impression on this side of the Atlantic. In fact, American interest in the hypotheses practically died out soon after 1860. They were not widely accepted before the Civil War, and all but forgotten afterwards.

In Europe, work went steadily on, and the research of Bassi, Ehrenberg, de la Tour, and others was continued in the work of Pasteur and Koch. Lister accepted Pasteur's germ theory of disease and applied it to surgery as early as 1864, long before that theory reached America. In 1876, Austin Flint, writing on "Medical and Sanitary Progress" in *Harper's Magazine*, was still able to say that while "specific organisms of microscopic minuteness" had been claimed by some as the cause of certain diseases, "by the majority of medical thinkers, however, the demonstrative evidence is not considered as complete."[29] In another five years American medical men suddenly awoke to find the demonstrative evidence complete, and the germ theory of disease was rapidly accepted by the majority of them.

Thus the hypothesis which seemed the least likely in 1840, proved to be the ultimate solution by 1880. When the sciences and techniques allied to medicine had advanced to a point which made experimental testing of these hypotheses possible, the theories of the early animalculists were finally vindicated.

[28] *Cf.* John Grove, *Epidemics Examined and Explained* (London, 1850); Theophilus Thompson, *Annals of Influenza or Epidemic Catarrhal Fever in Great Britain from 1510 to 1837* (London, 1852); James Morris, *Germinal Matter and the Contact Theory* (London, 1867); Joseph Lister, *The Collected Papers of Joseph Baron Lister* (Oxford, 1909), early papers on the germ theory; Lionel S. Beale, *Disease Germs: Their Real Nature* (London, 1870); James Ross, *The Graft Theory of Disease* (Philadelphia, 1872—American edition); T. Maclagan, *The Germ Theory Applied to the Explanation of the Phenomena of Disease* (London, 1876).

[29] Flint, "Medical and Sanitary Progress," *Harper's Magazine*, LIII, No. CCCXIII, June, 1876, 83.

BEGINNINGS OF MINNESOTA PUBLIC HEALTH *

PHILIP D. JORDAN

The North Star country, lying in the upper midwest but away from the great heartland of the Ohio Valley, was not the healthy region that some nineteenth-century travelers and promoters described. Minnesota was a beautiful land of many lakes and prairie stretches and tall stands of timber. It was also a country that sapped the strength of strong men, so that they prayed: "Lord, thou can't send down upon us any more afflictions." Minnesota, like all frontiers, was a place where settlers took sick and frequently died. Even sturdy lumberjacks from Maine who logged the mighty pine stands along the St. Croix knew the ravages of smallpox and diphtheria. Countless foreigners, come from the glittering fjords of Norway and Sweden, wrote pathetically of contagious diseases. For a time Minnesota was known as the leper state.

Public health was private health until after the Civil War. Each individual cared for himself as well he might, trusting all too frequently in the mumbo-jumbo of folk charms and to the efficacy of Old World superstitions. They drank where they pleased; dug privies at the whim of caprice; buried their dead without too much thought of sanitation; and, for the most part, scoffed at the findings of a new science. All this was to change when a young military surgeon, Dr. Charles N. Hewitt, fresh from the Civil War campaigns in Virginia, arrived in Minnesota to establish private practice. Hewitt became a founder of the state medical association. He was a strong believer in preventive medicine. He was a prime mover in recommending a state board of health, which the legislature created and which became law on March 4, 1872. Hewitt was proud that the Minnesota board was the fourth such agency in the United States. Massachusetts had established a state board in 1869, California in 1870, the District of Columbia in 1871, and Minnesota and Virginia in 1872.

* Sources not indicated, but paper based on material in the Minnesota Historical Society and on manuscripts in the office of the Minnesota State Board of Health.

Dr. Hewitt, beetle-browed and sporting a Grant beard, was named secretary, a position that he held for almost a quarter of a century. A man of vast energies and enthusiasms, as well as of dogged determinism which admitted of no compromise, the new secretary set to work. His first report, issued in 1873, indicated clearly that he believed in pushing a program of preventive medicine. He spoke, for example, of the ravages made by typhoid fever, maintaining that adequate controls could certainly reduce the death rate; he interested himself in the causes of disease; and he invited essays on tapeworm and Norwegian leprosy. He campaigned for a careful recording of vital statistics.

Before the state board could give him adequate technical assistance, he did his own throat cultures and sputum tests. His voluminous correspondence—much of it still preserved—shows that he kept in constant touch, not only with local health officials, but also with national officers. In 1888, he was elected president of the American Public Health Association. He was a meticulous researcher, insisting upon the importance of tracing the source of infection in each individual case. He found time also to interest himself in the problems of the inspection of immigrants, of quarantine and of disinfection of baggage.

Hewitt believed emphatically that immigrants should be segregated from other travelers. This was especially true in 1892, when cholera was present. When health officials suggested that immigrants having a clean bill of health from Chicago authorities need not be segregated, Hewitt was furious. "Oh, I'll have no such nonsense as that!" he wrote. "Chicago is a large distributing point where an immigrant train from the East is broken up and the immigrants in small lots then scatter here and there over the West. Now there is just as much danger of infection from a lot of three immigrants as there is from 100 immigrants, and I insist that each lot, no matter how small, be carried alone in a separate coach. We will make arrangements to have a health officer at each station where immigrants get off in Minnesota."

As the new science approached with its far-reaching discoveries of Pasteur and Koch, Hewitt expanded his laboratory. But Minnesota was far from Europe, where such remarkable experiments were

being undertaken. The Minnesota secretary, eager for knowledge, secured a five-month leave in the autumn of 1889 to study the systems of sewerage and garbage disposal of the Old World and to acquaint himself with new methods of vaccine production and bacteriological research. Before he returned he visited the slum areas of Dublin, the public vaccine stations of London, the Pasteur Institute in Paris, and the rural and industrial districts of England. As a student at the Pasteur Institute, he was given a laboratory where he enthusiastically observed the Pasteur method of treating rabies, the bacteriology of diphtheria, the bacteriological methods used in the investigation of tuberculosis, and the treatment of anthrax. Pasteur himself was described as a "little old man with a strong face, anxious but vivid."

Hewitt returned to Minnesota to begin one of the most dramatic experiences of his professional life. During the winter of 1890, he made arrangements for a supply of young calves. In the stable, he fitted up a primitive laboratory. On December 30, he inoculated the first calf with vaccine obtained from the Massachusetts State Board of Health. Fifty of his sixty-four inoculations succeeded. Five days later, he inoculated a second calf, "a very fine nursing bull calf," from the first three pustules of the first calf. Later he started another strain of vaccine obtained from the Animal Vaccine Station in London. He planned to compare the two resulting vaccines. He reported that there was no reaction in any of the calves and that not one "showed any variation of temperature, appetite or any other evidence of ill-effects. I have not ventured to use the vaccine on children yet, but shall as soon as I have applied every test of its purity."

Hewitt was extremely anxious to establish free vaccine stations, for Minnesota had its own large share of smallpox. Yet public opposition was intense. Much of the antagonism arose from the belief that the vaccine was more dangerous than the disease. Hewitt wished to produce a pure vaccine for use on the fifty to seventy-five per cent of Minnesota children who were not protected. He worked day and night, making every test and checking his results repeatedly. Finally he reported to the American Public Health Association that two thousand persons had been vaccinated with perfect success and good

results. Samples of the lymph sent to England were found to correspond perfectly with the English strain.

His first station was established at Red Wing, his home. Physicians received five points free for the first trial. Printed directions were enclosed, and a postal card included for a report on results. To induce children to return for examination on the seventh day, a "Certificate of Vaccination" was prepared to be signed by the health officer.

After January 1, 1894, the vaccine station was self-supporting. By January 11, 1897, it had furnished 26,240 points of vaccine to the state board. Perhaps nothing influenced the health of Minnesota more than did Hewitt's stubborn insistence upon vaccination and his own efforts—largely unaided—to produce a pure product.

One of the great centers where smallpox frequently hit was the lumber camp. From the early nineteenth century, when men from New England first began to swing their axes in the big woods to past the turn of the century, loggers' camps were centers of disease. Far removed from the scrutiny of health officials, these thriving wilderness cities were frequently a law unto themselves. Their constantly shifting population made controls next to impossible. Privies frequently were located next to cookhouses; and cookhouses set too near dormitories from whose windows, it was said, a jack easily could spit into the soup. The camps were full of diphtheria, typhoid, venereal disease and smallpox. Of all these, smallpox was a major problem.

When smallpox hit, it was not unusual to vaccinate all the lumberman and then burn the camp. Deputies guarded the jacks, so that they would not flee before vaccination. They moved like frightened sheep, commented one of Hewitt's health officers. Had they been wise in the way of public health, rather than lumberjacks, the frightened men would never have resided in many company camps in the first place.

A vivid account of camp conditions was sent to the Minnesota state board in 1902.

> I would like to draw your attention at this time, while the smallpox epidemic is spreading, to a condition which in my mind should not exist in a civilized country. I think that this will be a surprise to you. It is in regard

to logging camps all over the woods. I will in short describe to you a night which I spent in a camp; and so are other camps. Now just a structure low and damp, where there are about 80 to 100 men heaped together, with so-called bunks on each side and in the center a gangway, and on each end a heating stove. All along the gangway there are wet clothes of those 80 to 100 men hung up, and then shut off all air so there will be a temperature of 100 to 110° in the top bunks so that their clothes may be dry in the morning. I think the owner of those camps should be compelled to erect a store room for drying their clothes where there is such a number of people in one small room. . . . The next morning after this night three men staid at home on account of being sick, and that noon they left to go to another camp. It is dreadful to sleep in such places.

Minnesota health authorities knew what was going on. It was not unusual for them to receive this type of letter from local physicians: "Yesterday there were two cases of small-pox brought into Duluth by the Duluth & Iron Range Ry., from Mitchell and McClure's Camp near the station York. Again today we have received another from Lester's camp, over the same road." The state board urged trainmen not to accept smallpox patients for transportation and even furnished conductors and brakemen with illustrations of the pox with which to make a "railroad diagnosis." The board did its best to provide for medical inspection and for treatment. But it emphasized first the imperative need of vaccination.

In 1901 and again in 1904, public health officials met with representatives of the lumbering interests to try to devise some means of checking the disease which, both parties agreed, had been epidemic in Minnesota since 1899. These meetings were held in Duluth and occasioned much comment. All conceded the following figures.

Year	*Cases*	*Deaths*
1899	257	11
1900	1,371	22
1901	8,485	43
1902	8,666	29
1903	4,502	55
1904	2,343	38
1905	2,108	10
1906 to 3/26	144	0
TOTAL	27,876	208

Although all admitted the proportions of the epidemic and most held that the majority of smallpox cases came from rural areas and from lumbering camps, few interested parties were willing to do anything that might cut down the large companies's profits. When a state public health official suggested compulsory vaccination for lumbermen, he was told by a company official that "it was not practical and to make such a demand as that would probably drive workingmen out of the camps."

A representative of Alger-Smith and Company arose in one of the Duluth meetings to make this statement which seems indicative of the attitude of some of the lumbering firms.

> It seems to me that special reference is made to the business of lumbering here. I do not know much about medicine, but it has never been my opinion that men got smallpox in the pine woods. I thought that was about the healthiest place to work. In my opinion smallpox visits from the cities to the woods and back again, and I think that the lumbermen of this district have been just as earnest as any other section of business men. . . . We will do all we can to help, but do not cripple the lumbermen.

Each year a series of resolutions was passed for the sanitary control of lumber camps and other industries. Most of them were honored as far as the companies were able, but even the state board realized that the best answer of all would be a state law making vaccination compulsory for adults. That could not be secured.

Regulatory measures for the control of health in lumber camps—those spots usually known to the public as the residence of mighty Paul Bunyans—gradually succeeded in checking disease. They provided, in general, that all persons responsible for supervision of camps also were responsible for enforcing health regulations. This included owners, managers, agents and foremen. It was stipulated also that dwellings provide at least three hundred cubic feet of air space for each occupant, and said further that floors must be made of wood and must be raised from the ground. A separate building was to be set aside for the sick. Cookhouses came in for specific attention. They were to be separate structures "with proper conveniences for the cleanliness and comfort of employees." Public health officials were to inspect them from time to time. Refuse was to be deposited in buckets. These were to be removed regularly to a safe distance from

the kitchen before being disposed of. Disposal must not create a nuisance or contaminate drinking water. Health officers were charged with the responsibility of locating latrines and with seeing that they were maintained in a sanitary condition. Stables were to be located at least one hundred and twenty-five feet from any dwelling or from the cookhouse.

The measures provided also that camps be located with due regard to healthfulness and that they must be properly drained. All employees in the lumbering, mining or railroad industries were to be assessed not less than fifty cents and not more than one dollar per month, which sum was to be paid by the companies to a physician who was charged with maintaining personal health and treating the sick. This company doctor, in addition, was to inspect camps at least once a month. The question of vaccination, of course, was vexing; but finally employers agreed on paper at least to require a certificate of recent successful vaccination before hiring a workman. To what extent this provision actually was carried out is difficult to determine, but there is evidence to indicate that it was not totally ignored. An outbreak of communicable disease was to be reported directly to the state board of health. Each camp was ordered to post publicly the printed regulations of the state board. Finally, Section 13 stipulated: " Every measure required to be taken by a local Board of Health or any medical health officer, sanitary inspector or other health officer under the Public Health Laws, or any Regulation made thereunder in any organized municipality must be at once taken by the employer and his employees or agents, or the physician employed by the same, whenever any suspected communicable disease included therein, breaks out in any camp, works or dwelling."

These thirteen, out of a total of sixteen regulations, served as heavy hammer blows by which health conditions in Minnesota camps finally were brought under partial control. Some companies inaugurated a plan of their own. They charged jacks a flat fee of ten dollars—deducting it from their pay—at the first opportunity. For this sum the lumberjack, miner or railroad worker received complete medical care, including hospitalization, if necessary. The difficulty, of course, was that turnover among such laborers was large. A jack might spend only a week or month at a camp and then—because the

food was not to his taste, because the foreman was unpleasant, because the work was too heavy, because the pay was too low or merely because he became bored—pick up and leave. When he took another job, another ten dollars was withheld from his pay. Many jacks considered the ten-dollar plan only a carefully concocted scheme on the part of the companies to reduce his income.

The struggle was long and hard. The campaign to improve health conditions in the camps probably would have been successful eventually. But the great timber areas of Minnesota were being denuded after the turn of the century. More and more companies folded up or went westward to resume activities in the forest areas of the Pacific Northwest. By that time public opinion had done what no amount of hard work had been able to accomplish in Minnesota's hey-day of lumbering. Vaccination laws were being looked upon with favor. The fiercely independent lumberjack of another day who liquored and fought his way up and down Minneapolis's rowdy Washington Avenue was an almost forgotten type, passing from the scene as has the cowboy and the sheep-herder of the great western plains. In a sense, the frontier days of public health in Minnesota passed with the lumbermen, although, of course, the fight in general never ends.

Dr. Hewitt laid the firm foundation of the public health movement in Minnesota. He knew the state and its multiple problems intimately. At the height of a distinguished career in 1897, he suddenly was not reappointed secretary by a new governor. Devoted to his job, he never had requested reappointment, believing that his record was sufficiently admirable to make his tenure permanent. At work in his office, he suddenly received notice that his name had not been included in the list of appointments to the board. The story goes that within fifteen minutes after hearing his fate, he had gathered up a few personal belongings, said good-bye to assistants of years and walked out of his office. He never passed through its door again.

His dismissal created a public furor, but he himself seems to have remained discretely silent. He turned to Red Wing and resumed private practice. But if he refused to comment upon the reasons for his unexpected retirement, his wife, many years later, spoke plainly. She said that a Minnesota Republican politician had approached Dr. Hewitt with a request for a five-hundred-dollar campaign con-

tribution. " My husband," Mrs. Hewitt continued, " declined, stating that the State Board of Health had never mixed with politics and never would with his consent. Mr. Bixy then remarked that he had better change his mind as a matter of policy—and the matter was dropped between them." The non-reappointment probably was mainly caused by the doctor's refusal to contribute, but possibly other factors entered in. Hewitt was a determined and a stubborn man with a little of the autocrat in him. He had made enemies, some of them in his own board. It is possible that a clique within the board itself actively worked against him.

Regardless of this, Dr. Hewitt's contribution to the pioneer period of public health in Minnesota may best be summed up in his own words: " This, then, is my last report. The 4th of March next the board will have completed its first quarter of a century, so that my service as secretary has been within two months of twenty-five years. The best years of my life have gone into this work. I have spared neither time, labor nor thought to make it what it ought to be . . . I am still more anxious that it continue to serve the whole people of Minnesota in the future as in the past."

ALONZO THRASHER KEYT, CARDIOLOGIST

DAVID A. TUCKER, JR.

My interest in the subject of this sketch was first aroused by a story related by the late Dr. John Griewe of Cincinnati. While in Europe during the summer of 1910, Griewe arranged to visit Sir James Mackenzie in London. Dr. Mackenzie had published his work on *Diseases of the Heart* some two years previously and had won world renown for his elucidation of the cardiac arrhythmias by means of the polygraph. Dr. Griewe explained that he was interested in the operation of the polygraph and the interpretation of the tracings. Whereupon, Mackenzie stated that he was greatly surprised that anyone should find it necessary to come to London from Cincinnati for such a purpose because one of the most ingenious pioneers in such investigations had conducted his research in Cincinnati. He then referred to Keyt.

It is now recognized that information provided by sphygmographs and cardiographs is limited and fell far short of the expectations of the earlier observers. It was however important, as being the first step in the application to cardiology of the graphic method of record, which has thrown great light on hemo-dynamics.

Alonzo Thrasher Keyt was born January 10, 1827 at Higginsport, Ohio, a small village on the Ohio River about fifty miles east of Cincinnati. He was the son of Nathan and Mary Thrasher Keyt. His father was of Dutch ancestry. His mother came from Quaker stock, a descendant of Edward Penn. While still a small boy the family moved to Moscow, Ohio. Here he secured the rudiments of his education in the local district school. He then attended Parker's Academy at Felicity, Ohio, where he studied algebra, geometry, natural philosophy, and the classics.

In 1845, he began the study of medicine under the preceptorship of Dr. William Johnston, of Moscow, a practitioner of unusual attainments for the time and place. In the fall of 1846, he matriculated at the Medical College of Ohio.

The Faculty of this College was composed of John T. Shotwell,

John Locke, Reuben D. Mussey, L. M. Lawson, M. B. Wright and John P. Harrison. While they were all able men, Locke, Mussey and Wright had gained a national reputation. The teacher who exerted the greatest influence on the young medical student, however, was John Locke, chemist, who possessed an encyclopedic fund of knowledge and an inquiring philosophical mind, and, who was very adept at experimentation. No doubt Keyt's scientific attitude towards medicine was largely due to the inspiration and training he gained from this teacher.

The degree of Doctor of Medicine was conferred on Keyt in March, 1848, and he entered immediately upon an interneship at the Commercial Hospital (now the Cincinnati General Hospital), having received the appointment after a competitive examination. On the completion of the hospital year, Keyt returned to Higginsport to enter practice. He had little immediate success for as a contemporary wrote " Youth and a smooth face were never to the people of the country, tokens of medical skill, and waiting for one year with poor encouragement Keyt removed in 1850 to Walnut Hills," at that time a small village about two miles from Cincinnati. Keyt remained a general practitioner in Walnut Hills until his death on November 9, 1885.

In 1873, Keyt began his studies of circulatory phenomena by means of the graphic method. He reviewed the work of Vierordt (1855) and Marey (1860) and made sphygmographs after their models. He was soon convinced that the limitations of these devices made them unsuitable for scientific work, and after experimenting for three years, he constructed an apparatus which he termed the compound sphygmograph. With it he could record graphs of an artery and the heart, or two arteries synchronously, together with that of a chronograph.

Having constructed the instrument Keyt devised a schema of the circulation to test it. This consisted of a bulb which was to act as the heart, a reservoir to contain the fluid, and tubing to represent blood vessels. He used tubing made of various materials and of various sizes, as well as liquids of different densities in his studies.

His first observations were made to determine the length of the time of the systole and diastole of the heart. From a large number of

observations on healthy individuals he drew the following conclusions:

1. In the normal heart the rhythm of its movements is continually changing, and the change pertains to the duration of its entire revolution, and to that of both systole and diastole.
2. The duration of the diastole changes in much greater degree than that of systole.
3. A longer systole may go with a shorter pulsation; and a shorter systole with a longer pulsation.
4. Invariably a longer diastole goes with a longer pulsation, and a shorter diastole with a shorter pulsation.
5. In the normal heart, beating at about 75 to the minute; the average ratio of systole to diastole is very nearly as two to three.

Another series of observations was concerned with the velocity of the pulse wave. We quote as follows:

1. The velocity of the pulse-wave is determined above all by inherent states of arterial elasticity; being slower as the arteries are more elastic.
2. It is incessantly changing, within small limits, in consequence of variation of arterial tone; being faster as the tone is higher.
3. It diminishes with the size of the artery traversed.
4. It tends to increase with increase of arterial pressure, but modification from variation of pressure often fails to manifest.
5. It is not perceptibly modified below the site of an arterial obstruction, but the distal wave is delayed there in consequence of check at the site of obstruction.
6. It is not perceptibly modified in an artery below the site of an aneurism, although the distal wave may be delayed there in consequence of absorption by the yielding aneurismal walls.

Arterial rigidity as a causative agency in increasing pulse-wave velocity was established by Keyt, who thought that determinations of the velocity in various areas would estimate the degree of arterial hardening.

Keyt spent a great deal of effort on the measurement of the interval of time between the beginning of ventricular contraction and the opening of the aortic valve, or the beginning of the aortic pulse. He termed this period the presphygmic interval, and, thought that its determination had an important diagnostic value in valvular heart disease. He supports his conclusions by the analysis of numerous graphs made on patients who later came to autopsy.

He asserted that an abnormal delay of the pulse-wave was present in mitral regurgitation and stated:

> It is present in all cases of pure, harmful mitral insufficiency, and is absent only in insignificant, harmless regurgitation, or in regurgitation complicated with aortic insufficiency.
>
> It measures by the amount of retardation the amount of the regurgitation.
>
> In conjunction with apex systolic murmur its presence is conclusive of mitral insufficiency.
>
> Compared with apex systolic murmur, this sign is more positive and appreciative, and distinguishes, which the latter does not, between harmful regurgitation and harmless conditions.
>
> By the aid of this sign a positive diagnosis may be made at once in any stage of the case, and without waiting for the development of sequences and symptoms.

He also showed that thickened and sclerotic aortic valves delay the transmission of the pulse-wave by the study of two cases, which came to autopsy. He noted also that on rare occasions "increased delay was due to a locking of pathologically changed valves, which might occur when the valves were stiff and thickened, and notably loaded with calcareous masses. They close with a species of locking and are forced open after a prolonged effort of the ventricles."

It is somewhat surprising that, although he noted the venous pulsation Keyt apparently made little effort to study it. Had he done so he might have anticipated some of Mackenzie's work on cardiac arrhythmias.

Keyt published many papers in various medical journals including the *Journal of the A. M. A.* These were put together and edited after his death by Drs. A. B. Isham and M. H. Keyt under the title *Sphygmography and Cardiography* and published in 1887. Keyt constructed several sphygmographs which he forwarded to various physiologists in Europe.

In conclusion, I should like to quote a contemporary description of Dr. Keyt.

> He was five feet six inches in height, spare in person, somewhat stoop-shouldered, of fair complexion, with high, broad forehead, gray eyes, roman nose, thin lips, firm mouth, decided lower jaw and chin, light brown hair and full beard, without moustache. In manner, he was sedate, almost grave, slow and deliberate in action, in accordance with the Dutch blood coursing in

his veins. The Quaker strain made him as sparing of speech as was General Grant, who was bred amid precisely the same surroundings, not many miles removed. The secrets of his clients were safe with him. He could talk well and entertainingly when so inclined, but the spirit seldom moved him so to do. He possessed a keen sense of humor, and an appreciation of anything mirth-moving or ridiculous, but he exercised a control over the outward expression lest he might be deemed wanting in dignity, or might inadvertently wound the sensibilities of some one. He had no vices, neither using alcoholic liquors or tobacco, nor engaging in any diversion in which there was an element of chance. Though not a member of any church he was reverent toward the ordinances of religion, and believed in God as the creator and governor of the universe. Religion, morality and law found in him a steadfast supporter. He was charitable, contributing in consonance with his means to all worthy appeals, and giving freely of his services to the poor. He guided his conduct by the Hippocratic oath and the code of ethics of the American Medical Association. If he ever did injustice to, or wronged any one, it was done unwittingly, and he was ready to make amends. Under injury done by others to himself, he was patient, not resentful, trusting to time to make all things even.

Death came suddenly on November 9th, 1885, and, was recorded as being due to paralysis of the heart. A post-mortem examination was made and revealed " calcareous granules on the segments, with incompetency, of the mitral valve, atheromatous degeneration in the heart and aorta, fatty and friable condition of the cardiac muscles, and dilatation of the left cavities."

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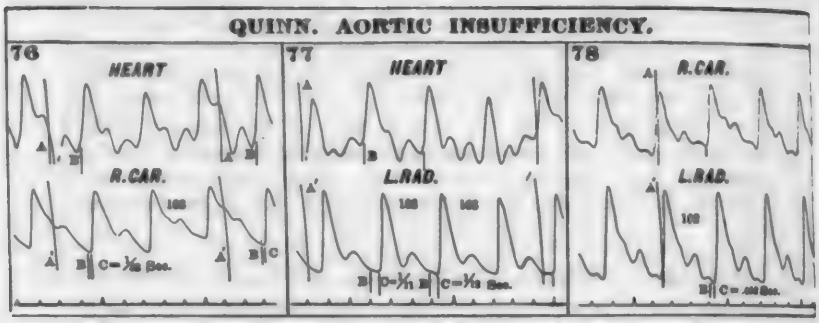

FIG. 94.—SIMULTANEOUS TRACES IN A CASE OF LARGE AORTIC INSUFFICIENCY, SHOWING ABNORMAL SHORTENING OF THE CARDIO-CAROTID AND CARDIO-RADIAL INTERVALS.

Fig. 1.

Graph showing application of sphygmograph in clinical investigation.

CH is the chronograph, of which *W'* is the winder, D' the dial, *P'* the pendulum, and *L'* the tracer; *Z* is the double rest for the levers. On the glass, in direct view, are three tracings —one of the heart, one of an artery, and one of time in seconds and fifths.

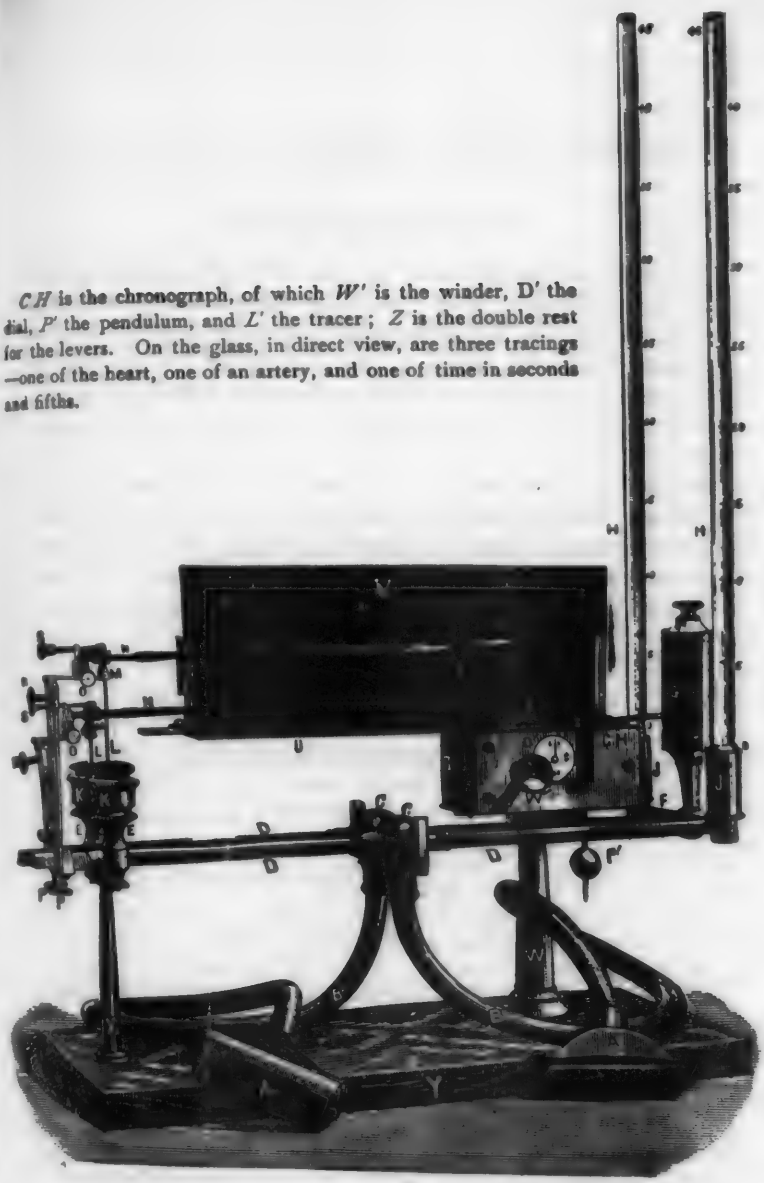

Fig. 2.

Keyt's compound sphygmograph.

THE BEGINNINGS OF MEDICAL EDUCATION IN CALIFORNIA

WM. FREDERICK NORWOOD*

As a result of the gold strike near Sutter's mill on the south fork of American River in 1848, California suddenly became a crucible into which were cast indiscriminately samples of humanity snatched at random from the whole world. Fortunately the principal ingredients in this potpourri on the Pacific Coast were from the population of the country to whose domain the El Dorado had recently been added.

Doctor J. D. B. Stillman, an argonaut who set sail from New York in January, 1849, in writing his memoirs a quarter of a century later, recalled a stanza of one of the many theme songs that whipped the country into a foam of excitement. It was probably penned by some zealous traveler with apologies to the then popular Stephen Foster.

I soon shall be in Frisco,
And then I'll look all 'round,
And when I see the gold lumps there
I'll pick 'em off the ground;
I'll scrape the mountains clean, my boys,
I'll drain the rivers dry,
A pocket full of rocks bring home—
So, brothers, don't you cry.
Oh! California,
That's the land for me,
I'm bound for San Francisco,
With my wash-bowl on my knee.[1]

Wave after wave of migration swept westward across plains, mountains, desert, and by sea, depositing in the Golden State men from all strata of American society. American individualism, unrestrained except for the simple and speedy justice of the "diggins,"

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[1] J. D. B. Stillman, *Seeking the Golden Fleece; A Record of Pioneer Life in California*, p. 23.

had its day. Among the gold seekers were men of the scalpel, not a few of whom reverted to the practice of their profession before or after the rush subsided.

When regular members of the profession began to fraternize and take stock, they discovered that California was overrun with an aggregation of quacks and medical fakers. The public offered little aid toward reform, because it was, for the most part, uninformed and uninterested. The press of the day in its advertising columns lauded patent medicines and medical crooks along with household wares for the pioneer. A Doctor Barlow Smith astutely labeled his medical emporium the Smithsonian Medical and Hygienic Institute.[2] Another, Dr. L. J. Czapkay's Grand Medical and Surgical Institute of San Francisco, declared to readers of the *Southern Californian*, a Los Angeles weekly, that it had been established for the permanent cure of all private and chronic diseases and brazenly added, " for the suppression of quackery." [3] In an atmosphere distinctly mercenary, not a few degreed practitioners fell from grace and broke the code of honesty and ethical conduct. Alarmed at the situation, the so-called regulars formed the California State Medical Society in 1856 in an effort to retrieve the dignity of the profession and stem the turbid tide of quackery.[4]

At its first meeting charter members of the State Society felt impressed with the importance of training physicians as well as licensing physicians in California. Inasmuch as the American Medical Association was at that time particularly exercised over the problems of medical education, the Society appointed a committee to study the problems confronting medical schools of the country. There were, of course, no medical schools in California, but the committee headed by John F. Morse, a University of New York medical graduate (1844) and first editor of the *California State Journal of Medicine*, was not backward, in 1857, about giving advice to the schools two to three thousand miles away. Substitute German, French, and Spanish

[2] Henry Harris, *California's Medical Story*, pp. 173-74.

[3] Advertisement, *Southern Californian*, Vol. II, No. 19, p. 4, col. 5, November 21, 1855.

[4] " Minutes of the Proceedings of the Convention and of the Medical Society of the State of California," Sacramento, March, 1856, *California State Medical Journal*, Vol. I, pp. 5-20, 1856-57.

for Hebrew, Greek, and Latin, suggested Dr. Morse, with an obvious accent on the practical at the expense of the classical.[5]

Efforts to organize local medical societies were made during the 'fifties in five of the pioneering communities: Sacramento in 1850, San Francisco in 1850, El Dorado County (Placerville) in 1856, Yuba County (Marysville) in 1856, and in Tuoloumne County (Sonora) by or before 1858.

When the Sacramento medical profession, almost fifty strong, met under auspicious circumstances on May 5, 1850, and organized California's first medical society, the Medico-Chirurgical Association, Doctor J. D. B. Stillman, an early forty-niner, who was named corresponding secretary, confided the whole affair to his diary. He concluded the entry with these words:

> Three of our officers have been Presidents of county societies at home. . . . So, hurrah for our noble profession and the new Republic of the Pacific![6]

In their efforts to duplicate the professional patterns of the Eastern communities from whence they came, the practitioners who settled in San Francisco seemed to have had a most tempestuous experience in forming a society. Henry Harris refers to San Francisco in 1850 as the "closest outpost to hell." It had a population of twenty-five to thirty thousand—a heterogeneous mass of people whose principal interests were mining, shipping and commerce. Harris, who has steeped himself in the lore and literature of the time, says:

> They were entertained, governed and drained by the most notorious aggregation of parasites of both sexes and all colors that the world had probably ever seen foregather up to that time. The medical gentry, although including many individuals of lofty character and intelligence, was about as spotted as the city's journalists, politicians and bartenders.[7]

San Francisco's medical men met to organize on June 22, 1850, about six weeks after Sacramento's successful effort. A constitution was adopted and officers elected. Within four months the San Francisco County Medical Society was moribund, having wrangled

[5] John F. Morse *et al*, "Report of Committee on Medical Education," *Ibid.*, pp. 439-40.

[6] J. D. B. Stillman, *op. cit.*, pp. 163-64.

[7] Harris, *op. cit.*, p. 121.

itself to death over a fee schedule. The San Francisco Pathological Society began in 1851, the San Francisco Medical Society in 1853, and the San Francisco Medical-Chirurgical Association in 1855.

Medical organizations of the formative years reached their highest mark in 1858, according to Harris, for which year he reported twelve, including the State Society. Within twelve years of their founding all of these organizations disappeared. Indeed, Henry Gibbons, a graduate of the University of Pennsylvania (1829), writing as editor of the *San Francisco Medical Press* in 1865, bemoaned that there was "not one medical society in California, nor, as far as we know, anywhere in the three States of the Pacific." [8] Factors contributing to this shameful state of affairs were: (1) the sheer instability of the social structure; (2) too much collective energy devoted to quack hunting, leaving little time for constructive pursuits on the group level; (3) partisanship over the issues of the Civil War; and (4) failure by many practitioners to appreciate the value of active societies, which failure was manifest by lethargic disinterest or participation in internal feuds. The long period of recovery and reorganization of California medical societies began in 1868.[9]

Equal in importance to medical societies are hospital facilities in the maturation of a young society and in laying the foundation for medical education. California's first hospitals were conducted in tents. Later rudely constructed buildings were available.

William Taylor, a Methodist divine, who went to California as a missionary during the gold rush, found much to do in ministering to the sick and dying in San Francisco's hospitals. The scenes he described are both lamentable and revolting. Death, vile victuals, brutal nurses, filth and stench impressed the minister with the debauched and immature society in which he lived.[10]

Although all hospitals were not as bad as the one pictured by Reverend Taylor, facilities for the care of the sick were inadequate and prices were high, ranging up to sixteen dollars a day for private care. The State built a Marine Hospital in San Francisco in

[8] *The San Francisco Medical Press*, Vol. VI, No. 4, p. 188, January, 1865.
[9] Harris, *op. cit.*, pp. 126-27.
[10] Reverend William Taylor, *Seven Years of Street Preaching in San Francisco*, pp. 66-72.

1850. After unfortunate experiences with contract hospitals, the City of San Francisco began entering its indigent patients at the Marine Hospital, which was taken over entirely by the City in 1855. In the same year the Legislature took action encouraging all counties to establish their own hospitals and made available a moderate subsidy to aid the counties in discharging this obligation. The largest hospital established under the impetus of this policy was for the County of San Francisco, in 1855.

Such was the State of California, its medicine, societies, and hospitals in 1855 when thirty-three year old Elias Samuel Cooper, M. D., of Peoria, Illinois, arrived in San Francisco. Dr. Cooper was a medical graduate of St. Louis University in the early 'forties. He was a great admirer of Daniel Brainard, the founder of Rush Medical College, and when Cooper sailed for the Pacific Coast it was his intention to establish a medical school. He was booked for Portland, Oregon, but a fellow traveler persuaded Dr. Cooper to disembark at San Francisco. In spite of ill health, he possessed a powerful drive which carried him through seven years of extensive surgical practice, teaching, and medical organization and journalism in California.

Doctor Cooper early identified himself with the movement which resulted in the first organization of a California State Medical Society. New though he was in California, he was among the group which sent out invitations to the first meeting. His first professional venture was known as " Dr. Cooper's Eye, Ear, and Feet Clinic," a union of specialties not common today. When Dr. Cooper was sharply criticized by the president at a meeting of the Pathological Society for his advertising policy, he strode up to the presiding officer and flashed a clenched fist before his face and threatened to thrash him if he uttered another word of criticism. Dr. A. J. Bowie, reputed to be a Southern gentleman of some refinement and a believer in the code of honor, did his best to arrange a duel between Cooper and the president, offering the latter his services as a second. In a nearby saloon the Society's president washed away his determination to avenge the insult. In disgust Doctor Bowie changed his viewpoint and became a fast friend of Doctor Cooper.[11]

[11] Emmet Rixford, " Early History of Medical Education in California," *Annals of Surgery*, LXXXVIII, 3, pp. 322-23, September, 1928.

John F. Morse's committee on medical education made its report to the State Society in February, 1857. In addition to the committee observations previously noted, the Morse committee, referring to medical schools, declared that there were no "immediate indications of the practicability of the founding or the sustaining of such institutions" in California. The committee further palpated the tender spot with these words:

> As long as municipal governments regard hospitals as institutions in which the principal object seems to be to show the extent to which a bone-gnawing and washing-saving economy can be inflicted upon the impoverished sick, without any broad demonstrations of murder; so long as popular sentiment requires the managers of these asylums of benevolence to reduce the compensation for medical attendance to parsimonious pittance; so long as the soul-crushing and heart-withering maxim "buy cheap and dispense sparingly" is written upon every feature of these institutions, cheap buildings and cheap furniture, cheap bedding and cheap food, cheap physicians and cheap nurses, cheap medicines and cheap instruments, no books and cheap coffins; so long as these are the characteristics that distinguish the popular spirit of America, or perhaps more properly speaking of California philanthropy, so long will it be a useless thing to attempt the establishment of clinical schools of medicine which are the natural and proper nurseries of a complete medical education.[12]

In the next year (1858) Elias Samuel Cooper instituted his long projected medical school and Doctor Morse who wrote the committee report soon became a member of the faculty. The first session did not open until May 12, 1859. Doctor Cooper did not secure an independent charter for the school, which would have made of it a proprietary institution as were many of the contemporary Eastern schools, but he sold to the trustees of the University of the Pacific, a Methodist Episcopalian College at Santa Clara, the idea of annexing a school of medicine. Doctor Cooper was usually more successful in promoting enterprises among the laity than with his fellow practitioners. This union with the respected University of the Pacific gave to the new medical school a dignity of origin which could not be easily brushed aside by the founder's critics, even though the editor of the *Pacific Medical and Surgical Journal* chose to refer to the school as the "Cooper Shop."[13]

[12] John F. Morse, *Ibid.*, pp. 439-40.

[13] "Editor's Table," *Pacific Medical and Surgical Journal*, Vol. II, pp. 495-99, 1859.

Of the seventeen trustees governing California's first medical school, ten were clergymen and three were physicians. Officially the new school was called "The Medical Department of the University of the Pacific." The mothering institution of course was very small and its use of the term "university" as a part of its name arouses at least the curiosity of a historian. In the fall of 1860, the University had, excluding the Preparatory Department and the Medical Department, twenty-nine students, three of whom were seniors.[14]

The original medical faculty at the opening session in May 1859 included:

J. Morison, M. D., Professor of Principles and Practice of Medicine and Pathology.

Isaac Rowell, M. D., Professor of Chemistry.

R. Beverly Cole, M. D., Dean, Professor of Obstetrics and Diseases of Women and Children.

E. S. Cooper, M. D., Professor of Anatomy and Surgery.

B. R. Carmen, M. D., Professor of Materia Medica.

Hon. Geo. Barstow, Professor of Medical Jurisprudence.[15]

Ten men entered the first class. Two of these had studied a year elsewhere and were graduated at the end of the first term. In the six years of its existence before being interrupted in 1864, there were twenty-eight graduates.

Premedical requirements were a year of apprenticeship with a reputable physician or a high school education. The term was eighteen weeks. Two terms were required for graduation. Tuition was twenty dollars for each professor, payable in advance. The matriculation fee was five dollars and the graduation fee was fifty dollars. The eighteen weeks' term was a little longer than the average of Eastern schools, and board advertised at five to ten dollars weekly was much higher than the average reported in medical circulars elsewhere.[16]

The first circular of the school broadcast an invitation to students

[14] "Editor's Table," *The San Francisco Medical Press*, Vol. I, No. 4, p. 235, October, 1860.

[15] *University of the Pacific: Medical Department. Announcement of Lectures*, p. 5, 1859.

[16] Wm. Frederick Norwood, *Medical Education in the United States Before the Civil War*, p. 378.

in America and the tropics. The salubrious winds of the city, it was declared, secured " the health of the student from injury, the consequence of effluvium, so constant an attendant upon dissections elsewhere." The description of the course in surgery in the 1859 *Circular* shows extraordinary educational insight, but it is too extensive to be quoted here. Doctor Cooper's clinic and local hospitals offered fair opportunity for clinical teaching.

Some members of the Faculty were men of considerable note, professionally and otherwise. In the dramatic episode of the Vigilance Committee of 1856, Isaac Rowell, the future professor of chemistry, led the militia at San Francisco. In 1861 he wrote on the subject of bronchial asthma, after a year of animal experimentation in which he attempted to demonstrate the value of oxygen in suffocation.[17]

Richard Beverly Cole, dean and professor of obstetrics and diseases of women and children, an 1849 Jefferson medical graduate, reached California in 1852. Doctor Cole was in the midst of things in the San Francisco turmoil of 1856, but the story is too involved to relate here. In 1858, in a committee report to the State Society, he mixed oratory with professional observations and dealt rather loosely with the delicate subject of female chastity. His remarks charged that two out of three California women who had reached the age of fifteen were victims of " this dissipation and fashionable life." [18] What Doctor Cole intended for a scientific audience was surprisingly soon broadcast throughout California and the nation. An Albany, New York, paper took up the unfortunate remark and commented on the morality of women in California. California publishers flew to the defense of their women and denounced Doctor Cole.[19] S. G. Whipple, editor of *The Northern Californian*, compensated by pointing an accusing finger at the national capital which with the entire country was then absorbed in the details of the notorious Sickle's triangle tragedy.[20] Doctor Cole was exonerated, with

[17] Harris, *op. cit.*, pp. 187, 280.

[18] Richard Beverly Cole, " Report on Obstetrics and Diseases of Women," *Proceedings of the Convention and of the Medical Society of the State of California*, 1-3, 1856-58, p. 134.

[19] George D. Lyman, *The Scalpel under Three Flags*, p. 55.

[20] Editorial " Morality of the California Press," *The Northern Californian*, p. 2, June 1, 1859.

reservations, by the State Society the next year. It took longer for the public to forgive him, but his remarkable qualities of leadership and personality kept him in positions of responsibility.

In 1859 Doctor Levi Cooper Lane, a nephew of Doctor Cooper, visited San Francisco while serving as naval surgeon aboard the sloop *Decatur*. While in San Francisco Doctor Lane was offered the professorship of physiology. He accepted the offer and returned in 1861 after studying at Göttingen and Paris. In 1862 Doctor A. J. Bowie, of the dueling incident, became the professor of theory and practice of medicine.

In 1862 Doctor Henry Gibbons, an 1850 arrival, who had served as an original member on both the State Board of Health and the Board of Examiners, became the professor of materia medica and therapeutics. Doctor Gibbons was a Quaker of immaculate character and maintained the purity of his reputation as consistently as he pursued his practice of medicine.

It was a part of Doctor Cooper's indefatigable ambition to edit a medical journal which would be a mouthpiece for his school and offer a publishing outlet for his professional friends. This was realized in 1860 when he began publishing the *San Francisco Medical Press*. It also gave him more effective access to his professional enemies represented by the *Pacific Medical and Surgical Journal*, which began two years earlier. Much of Cooper's editorial space was devoted to a defense of the Medical Department.

Doctor Cooper died in 1862 when only forty years of age. Although he was not the dean of the school, he was its motivating force. His death weakened the institution, and Doctor Lane, his spiritual successor, was not yet influential enough to dominate the scene. There followed several changes in professorial appointments, accompanied by confusion.

In 1860, two years before his death, Doctor Cooper editorialized on the success of the Medical Department and the growth of San Francisco as a medical center. With reference to a current rumor that a second medical school might be established in the city, he boldly declared: "We hope they will." [21] Cooper was perhaps

[21] "Editor's Table," *San Francisco Medical Press*, Vol. I, No. 1, pp. 62-63, April, 1860.

whistling in the dark, but this very thing happened two years after his death. Doctor Hugh H. Toland, a surgeon of superior talents, finished his medical training at Transylvania University in 1828 and began practice in North Carolina. In 1852 he yielded to the California call and purchased the Gwyn mine in Calaveras County. Soon he decided in favor of his profession and opened an office in San Francisco, where he developed the most lucrative practice of his day. It was Doctor Toland, tall, erect, and skilful in surgery, who formed the new medical school bearing his name. The old school was apparently dying when, in 1864, the new school, Toland Medical College, opened in a new structure built and furnished by the founder at a cost of about $100,000.[23]

The available students, not enough for two schools, flocked to the new edifice. On the students' petition and the invitation of Toland, Lane and Gibbons joined the new faculty. Doctor Cole received no such invitation because he was unacceptable to Doctor Toland. For six years Toland Medical College thrived as a proprietary medical school without competition. Then in 1870 friction arose over appointments, and Doctors Lane and Gibbons withdrew and reorganized the original Medical Department of the University of the Pacific in 1871. After one year the school attached itself to the University (City) College, a Presbyterian institution, but advertised itself as The Medical College of the Pacific.[25] In 1882 it was reorganized as Cooper Medical College, and in 1909 an amalgamation was consummated by which it became the School of Medicine of Stanford University.[24]

The Toland Medical College was hard hit by the secession in 1870. All but one student went with Doctors Lane and Gibbons. Toland then began a flirtation with the trustees of the University of California, which ran a stormy course for three years, culminating in a union of the two institutions in 1873.

When medical education began in California, the state had a scattered population of less than 400,000, and San Francisco numbered about 56,800. The ranks of medicine were marked with charla-

[23] *Plan and Announcement of Toland Medical College* [1865], pp. 1-10.
[25] *Annual Announcement of the Medical College of the Pacific*, 1872, pp. 5, 6.
[24] *Cooper Medical College, Annual Announcement, Session of 1883*, pp. 7, 8.

tanism, fraud, and a shiftless moving about. Even the so-called regulars broke up into selfish factions. Economic inflation was almost unrestrained, and the social structure was distinctly unstable.

In terms of contemporary standards of medical education, the initial efforts of California's first medical educators can in no sense be classified as mercenary diploma mills, in spite of the prevailing social and economic confusion. San Francisco had hospitals, abundant anatomical material, and ambitious and spirited professors. The only serious shortage was on the student level. This was eventually solved by a rapidly expanding population.

There was a long lingering aloofness between the Cooper-Lane group and the Toland group, at times punctuated with sharp bitterness. According to Henry Harris, "hell and high water" have not sufficed to merge them into one school.[25] Why should they have merged? Their rivalry has mellowed into a wholesome competition between two of America's great medical schools—Stanford University and the University of California.

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[25] Henry Harris, *op. cit.*, p. 132.

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THE WORTHINGTON SCHOOL AND THOMSONIANISM

JONATHAN FORMAN

Ohio has always been at the crossroads of the nation, and, as a consequence, it has also been a battleground.

Because of its geographical position, its terrain, and its internal and bordering waterways, it was the site of many wars between different Indian nations before the white man came and also, near the end of the eighteenth century, the location of the major warfare between the white man and the Indians.

Because of the geographical position, the fertility of the soil and ownership during the Colonial period, it attracted early settlers from three different cultural areas—Virginia, Pennsylvania, and New England. As a result of the mingling of these three different groups, Ohio, throughout its history as a state, has been a political battleground. Moreover, in the nineteenth century, since each of these three groups of early settlers had different predominant church affiliations, Ohio became the chief battleground of different sectarian religious groups. Within its borders two important religious sects, the Disciples and the Mormons, passed their infancy.

Traceable to the same convergence of different social cultures Ohio has been the major battleground of conflicts between regular medicine and various medical cults and medical sects. The center of homeopathy was long in Northern Ohio, while the origins and centers of activity of both *Eclecticism* and the *Physiomedical Sect* were in Southern Ohio.[1]

This paper deals with Thomsonianism, the forerunner of the *Physiomedical Sect* and the Reformed Medical Society of the United States which sired Eclecticism. The founder of Thomsonianism came out to the Western Country and established an office in Franklin County, Ohio, where he and his disciples fought for predominance as practitioners of the healing art.

In Franklin County, the remnants of pioneer days still set forth clearly the identity of the original settlers. As one comes in from the South or Southwest, he is impressed with the large farms with their original masters' house set away back from the road, reminis-

[1] Waite, Frederick C., Ph. D. "Thomsonianism in Ohio." *The Ohio State Archaeological and Historical Quarterly*, 49: 1940, p. 322.

cent of Virginia from whence came the original settlers. The fact that one is passing through what once was military lands is verified by the names of townships and places—such as Washington C. H., for instance. If, on the other hand, one comes from the east over the National Highway, one will note that the farms are smaller, the houses smaller, nearer the road, and always of brick, the farming more intensive—reminiscent of Pennsylvania. When one goes north from Columbus, one comes almost at once to the village of Worthington with its town square, its tall white church spire—a typical New England village.[3]

The Village of Worthington

Worthington was founded in 1803 by Colonel James Kilbourne and his party of settlers, consisting of a millwright, a blacksmith, nine laborers and their families on a tract of 16,000 acres. This was located " on the banks of Whetstone, nine miles above Franklinton " (later included in Columbus) by the Scioto Land Company. Kilbourne filed this report as a result of his exploration in the spring and summer of 1802:

> The excellence of the trees and the 1000 acres of meadow, the fertility of the soil and the oak timber, in fact, everything possibly described was there except the healthfulness of the country.[3]

Fear of sickness which Colonel Kilbourne found prevalent among the natives was attributed to the meadows and bottom. These, the Colonel reported, were avoided by those who moved to the woods and uplands. He had further reassured the members of the Scioto Land Company by a statement from Colonel Worthington (then registrar in the land-office at Chillicothe).

> Colonel Worthington, who is a gentleman of first rate information, informed me that those families who were careful in their manner of living and housing from the damp air and fogs, generally avoid the fever; . . . He is of the opinion that when a little more is opened and more meadows are improved

[3] Forman, Jonathan, M. D. " The Worthington Medical School," *The Ohio State Archaeological and Historical Quarterly*, 50: 1941, p. 373.

[3] Lee, Alfred. *History of Franklin and Pickaway Counties.* Vol. 1. 1876.

by planting, mowing and feeding so that the immense vegetation does not putrefy in the ground and be wafted about in the air, (this) will become as healthy as any country whatever.[4]

Worthington Academy and College

Worthington's first private school was held in a large cabin built for that purpose. In 1808, the school was moved to provide a site for the Worthington Academy. This was housed in a new red-brick two story building. In 1819, the charter of the Worthington Academy was revoked and a charter granted to the Worthington College empowering to instruct "youth in all of the *liberal arts* and *sciences*; in virtue, religion, morality; and for *conferring all the degrees and the literary honors granted in similar institutions.*"

In 1817, Philander Chase, D. D., moved into the town of Worthington to be the pastor of St. Johns Episcopal Church. It is to be noted that Colonel Kilbourne himself had at the solicitation of his friends taken orders in the Protestant Episcopal Church, but had never accepted a permanent parish. In 1818, Chase was elevated to a Bishop (consecrated in Philadelphia on February 11, 1819). He afterwards founded Kenyon College and Gambier Theological Seminary at Gambier, Ohio, in 1820. When Bishop Chase's influence was directed away to Kenyon College, the Worthington College began to decline.[5]

The Worthington Medical College 1830–1842

In 1825, Wooster Beach, a native of Trumbull, Connecticut, who had studied under a couple of herb doctors, opened an office at 93 Elridge Street, New York City. Dr. Beach sought to extend his knowledge from scholarly physicians, formal practitioners, Indian doctors, followers of Thomsonianism or from any from whom he thought he could learn. One time when he was setting forth his notion of retaining what was useful in the old practice and adding that good to the new, a friend exclaimed half disdainfully, "You

[4] *Ibid.*

[5] Stein, Mary Alice. *Shedding Light on Worthington.* Woodrow Guild, Worthington, Ohio. 1931.

are an Eclectic!" Beach quickly caught the idea and replied, "You have given me the term which I have wanted: I *am* an Eclectic!" [6]

Soon after Beach located in New York City, he conceived a plan for a clinical institution and medical school. So in 1827 he opened the *United States Infirmary* and in 1829 the Reformed Medical Academy, which in 1839 became the Reformed Medical College. It, however, did not succeed in getting a charter from the state and so was compelled to give certificates of membership in "The Reformed Medical Society of the United States." This was followed by the name, W. Beach, President (established 1829). The other founders of this society included several of whom we shall hear shortly. These were: Thomas Vaughan Morrow of Fairview, Kentucky, Ichabod Gilson Jones of New York and John J. Steele, M. D. of Fayette County, Pennsylvania.

Acting upon the conviction that his ideas of medicine were to take root in the Mighty West, Dr. Wooster Beach, the Reformed Botanic, or as he called himself, the "Eclectic," issued a circular signed by himself and several of his instructors at the Reformed Medical Academy and sent it to various points in the West and the South, requesting "that any information from citizens in any of the towns on the banks of the Ohio River, concerning the location of this contemplated institution will be thankfully received." Fortunately, one of the circulars came into the hands of Colonel Kilbourne when the affairs of the College were in bad shape.

Accordingly, at the instance of Kilbourne, the Board of Trustees of Worthington College sent an invitation to Beach in New York City offering him its building for his proposed medical school in the West.

It is usually stated that the charter of Worthington College was forthwith amended, but to date no evidence has been found to confirm this fact. It rather seems that "The Reformed Medical College of Ohio 'better known as the Medical Department of the Worthington College,'" actually operated under broad powers in the original charter of the College.

[6] Forman, Jonathan, M. D. "Dr. Alva Curtis in Columbus; The Thomsonian Recorder and Columbus' First Medical School," *The Ohio State Archaeological and Historical Quarterly.*

Dr. John J. Steele, an apostate from regular medicine, who was commissioned to establish the school, soon got into trouble with the community by "indulging in habits incompatible with the moral sense of the community." The school opened for students in December, 1830. Soon thereafter came Thomas Vaughan Morrow, a cousin of Jeremiah Morrow, once Governor of Ohio, an outstanding individual of strong character who fitted well into the life of the community. With Dr. Steele had come Dr. I. G. Jones, who soon afterward (1833) married the daughter of Colonel Kilbourne and thereby became related to most of the "more dependable" pioneer families not only of Worthington, but of Columbus as well.[7]

Dr. J. L. Riddell was called to fill the chair of chemistry and botany. Dr. Adolph E. Waller has written much about this man who, while he was teaching at Worthington, published the first of our numerous series of books about the flora of Franklin County. In his book he listed more than 750 items.[8]

Jonathan Robert Paddock who had held a chair in the literary department of Worthington College added the teaching of Chemistry and Botany to his work on the faculty when Riddell resigned to go to Cincinnati to become adjunct in Chemistry and lecturer in Botany.

For the first few years the college was in a thriving condition and much enthusiasm was shown by the faculty and students. The citizens for miles around employed the members of the faculty in case of sickness. The few allopaths who attempted to locate in or near Worthington were soon frozen out.

Down in the City of Columbus the majority of the people were treated either by Dr. I. G. Jones and others from the Worthington School who had located within the city or by Thomsonians. In 1837, Jones was made physician and surgeon to the Ohio Penitentiary. When Dr. Jones, owing to an increasing practice in the Capitol, was obliged to move to Columbus, a graduate of Class of 1832, Dr. D. L. Terry, was called to a professorship and a partnership with Dr. Morrow. Not long afterward, he entered into new practice with Dr. Alva Curtis, the Editor of the *Columbus Thom-*

[7] Felter, Harvey Wickes, M. D. *History of the Eclectic Medical Institute, Cincinnati, Ohio, 1845-1902.* Published for the Alumni Association.

[8] Morrow, Thomas Vaughan. *Western Medical Reformer.* 1837.

sonian Recorder. Then he began to sow the seeds of discontent among the students and also in the hearts of Dr. Morrow's patients. Finally, in May, 1836, he went over bodily to the Thomsonians and subsequently engaged in acrimonious disputation through the *Thomsonian Recorder* with the Faculty at Worthington. The Worthington Faculty was not as good at this type of warfare as were Curtis and Terry. Nevertheless, they would express themselves fairly well as the following paragraph from the pen of Dr. Morrow shows:

> For endeavoring to effect a reformation slander and abuse have been liberally bestowed upon us by wiseacres, ignoramuses, and some more knowing, but not less reckless and designing members of the old school fraternity and also by some infatuated and strongly prejudiced followers of Samuel Thomson. Among these later, the high-toned, pedantic editor of the *Thomsonian Recorder* stands pre-eminent. So completely infatuated, bigoted, and blinded by prejudice is this self-styled doctor, that it seems impossible for him to utter a sentence respecting the Worthington institution without making some false statements.[9]

By 1837, Worthington had grown to a busy town with four stores, two public houses, many machine shops, an Episcopalian, a Methodist, a Presbyterian, and a Universalist Church and a population of nearly 700.

The Announcement for 1838 recommended the following texts:

Anatomy—Wistar, Horner, or Bell
Chemistry—Turner or Beck
Materia Medica—Eberle's Therapeutics or United States Dispensatory
Botany—Eaton's Manuel, 7th Edition, Lindley, Gray or Blake
Obstetrics—Velpau, Dewees, or James Burns
Theory and Practice of Physic—Ebull, Gregory or Mackintosh, Beach's American Practice is also recommended.
Medical Jurisprudence—Beck, Clutting or Ryan
Surgery—Cooper's First Lessons
Cooper's Surgical Dictionary; Lister's Elements
Physiology—Dunglison, Magendie or Richerard

The full expense of boarding, including lodging, washing, room and light—and the tutor's fee for the six months would be about ninety dollars; for the same during the spring and summer sessions of four weeks—about forty-five dollars.

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[9] Editorial, *Western Medical Reformer*, September 8, 1845.

The whole amount of expenses necessary to meet for the completion of a full course of studies, from the commencement, including the boarding expenses as well as tutor fees would not exceed $200; allowing the student to be engaged here in his study the term of two years.

The above fees served five lectures daily for five months in the fall and winter. The spring course of lectures was held on alternate days for three months. The summer courses were necessary for field work in botany.

The last week of each session was set aside for examination, granting of degrees and graduation. According to the Circular and Regulations, at no other time could degrees be granted, excepting honorary, unless by a special act of the Board of Trustees.

In 1836, the College launched its monthly Journal of Medical and Chemurgical Sciences: The *Western Medical Reformer* by the medical professors of Worthington College, editors and proprietors. This was designed to interest prospective medical students, physicians, and the public in the Worthington School and Reformed Medicine through the dissemination of the doctrines and practices of the Reformers. Some of its case reports were dramatic and calculated to convey that their methods of practice were superior to all others. The cause prospered and the next year, according to the Dean, three-fourths of the citizens for miles around were calling on the faculty for medical care. The Worthington Infirmary was opened for the care of the sick and for clinical instruction of students. Here for some $2-$3 per week, one could get board, room, laundry, and nursing.

The College had run into another of the periodic business depressions. Hundreds of banks failed; factories shut down; all work on public buildings, railroads, and canals stopped; thousands of workingmen were turned into the streets; Federal revenues failed to meet the current expenses; land sales fell off; and business came about to a standstill. This made the operation of the Worthington Medical College increasingly bad. Then the number of students fell off; subscribers to the *Western Medical Reformer* became delinquent, the citizens could not afford the luxury of the infirmary or pay for professional services when rendered at home.

Curtis and Terry were influencing many people in Columbus

against the Reformed Botanics in favor of their school of medicine. Dr. Reuben P. Calley had resigned the chair of anatomy and had become a bitter enemy of the school and its faculty. Removing to Delaware, some few miles north, he circulated an unfavorable story about the procuring of bodies for dissection. Enemies from all sides began to enlarge and exaggerate upon these tales. Suits were threatened and the faculty lost caste in the minds of the indignant citizens.

For ten years, the faculty had supplied the institution without any outside aid other than the use of the college building. Liberal State appropriations had been made to the Ohio Medical College in Cincinnati. But no such liberality had been shown the Worthington College. Money was needed for more chemical apparatus, to fit up and furnish more fully the anatomical museum and for a library. Repairs were also very much needed. Tuition had so far been applied to keeping up supplies.

Colonel Kilbourne who had served both in the Ohio Legislature and in the United States Congress suggested that the Legislature be urged to appropriate funds and private benevolence was appealed to. The only result, however, was to make it clear that Worthington was too small and would never grow enough to support a great medical center, and that, coupled with the successful attacks of its enemies, allopaths, homeopaths, and above all, Thomsonians, as well as the difficulty of securing additional material, led to a consideration of a plan to abandon Worthington and remove the school to Cincinnati.

The next year, 1838, it became necessary to abandon the Journal and to close the Infirmary. Notwithstanding all of these discouragements which made many people feel that the cause of medical reform was lost, Dr. Morrow would not entertain that idea for one moment.

Thomsonianism

The strongest enemy of the Worthington School and all it stood for were the followers of Thomson in Columbus, Ohio. Samuel Thomson, a simple uneducated man, devised a treatment of all diseases with the use of vegetable drugs. He was opposed to the mineral therapy of the allopaths and had no use for those who would improve on his system. His insistence on the old formula of

one cause for disease, one book, one treatment, and one master led him into one fight after another.

The great success of the Thomsonian movement rested on the publicity which it received as well as his method of organized distribution. In 1813, Samuel Thomson was granted a patent on his system of practice and in 1823 was granted a revised patent which gave him another 14 years to control his plan for treatment of disease. This was the first time a system of therapy had ever been patented, and it was the sire, therefore, of a host of patent medicines for the next century. It was Thomson's plan to permit groups to organize throughout the country and to practice his system of therapy. The movement spread rapidly. His book explaining the method and containing an engraved frontispiece which was the official patent right ran through 13 editions and sold over 100,000 copies. By 1839 over three million adherents were claimed by the originator.

The publicity in the western country was taken care of by Thomson's son, Horton Howard, who was in charge of the western office with headquarters in Columbus, Ohio; Samuel Robinson who wrote a passionate defense of the system; and Alva Curtis. These men all contributed greatly to the success of the movement and Ohio became one of the largest publishing centers of the cult.

The first number of *The Thomsonian Recorder* of Columbus dated September 15, 1832, included a call by Dr. Samuel Thomson for a "United States Thomsonian Convention" of delegates from "The Friendly Botanic Societies" to meet in Columbus, Ohio, on the 17th day of December, 1832. This business of holding a national meeting was a new movement among practitioners of the healing arts and in American politics and marks the beginning of pressure blocs in American legislation. Samuel Thomson had no thought of letting the convention get out of hand. He simply announced a desire to meet his numerous friends and to obtain from them knowledge of what they knew about medicinal plants, remedial procedures and the general progress of the cause of botanic medicine. The real purpose of the convention, however, was to tell the public that the treatment of Asiatic Cholera during the preceding summer by the regular school of doctors had been marked by an extraordinary num-

ber of fatalities, whereas the cure by the Thomsonians resulted in almost universal recoveries.

The convention also gave great encouragement to the Thomsonian practitioners and another purpose was uncovered when resolutions were presented and adopted in respect to prospective medical legislation in the several states. This new technique of concerted action through national conventions produced results. The Legislature of Ohio met in a few days and repealed its Medical Practice Act with all of its restrictions upon practice. The same year Alabama extended the same rights to Thomsonian practitioners as were enjoyed by other physicians. Before the year 1835 was over, almost all of the states had repealed the Practice Acts. Therefore, the Thomsonians were free to practice as they wished without restriction, so successful had been their first convention.

It was not all the work of this convention, however, for there were other forces at work. This was a time when the emphasis was placed upon the common man, upon the individual citizen. Since both regular medicine and the cults were resting upon an empirical basis rather than a scientific one, one man's opinion was as authoritative as another's and each citizen was entitled to select for himself the system of healing which he thought best. The only authority was that of the testimonial. Forceful characters supported each school of healing and they were willing and able to offer strong testimonials in its behalf. It is little wonder then that the legislature abolished its restrictions upon medical practice or extended its privilege to many of the schools of healing. So-called regular schools of medicine later grew into a real University discipline resting upon histological studies of disease. Once this mass of information led to the discovery of bacteria as the real cause of many diseases, all cults were at a distinct loss to compete.

At the Columbus Convention were many Botanic physicians who afterward became prominent teachers of the new doctrine. Alva Curtis, at that time a resident of Richmond, Virginia, sent in a most remarkable communication, setting forth his almost unbelievable success with Thomsonian procedures. Of 200 patients suffering with Asiatic Cholera, he had lost but one; and several of them had been in the state of collapse when he had been called. When Curtis'

adherence to the cause of abolition made him unwelcome in Richmond, he found it expedient to move to a Northern state. Since Ohio was in a period of rapid growth and Thomson's patent right was selling like hotcakes, he chose Columbus and accepted the editorship of *The Columbus Thomsonian Recorder*.

This gave him a chance to enter into controversy with the faculty of the Reformed School at Worthington, with the Orthodox Thomsonians and their beloved founder as well as the homeopaths and what one must call "the regulars" because at this time the regular physicians were by no means the dominant school in Columbus practice. Curtis was not content merely to beat his opponents in controversy. He believed firmly that no system of healing could maintain itself without schools of instruction. For that reason he was determined to establish such a school and thereby to insure the permanency of the things for which he stood. The founder, Samuel Thomson, being himself an uneducated man, was afraid to subject his system to the regimentation of a regularly constituted college curriculum. He frankly did not believe that the healing art was that complicated and, with all due respect to deans, one can see that there was a good deal then and possibly something now in what he thought about this matter.

By approximately the same mental processes by which he came to embrace Thomsonianism, he went on to develop his own ideas and so to read himself out of the orthodox Thomsonian movement. In 1835, Alva Curtis began to instruct students in his home and followed this effort with an application to the General Assembly for an Act of Incorporation. Regulars, homeopaths, orthodox Thomsonians, and the faculty trustees of Worthington College opposed him by artifice and calumny, but they found him able to beat them at every turn, to rebut every objection and to win friends and supporters in every conflict. At one session, the House of Representatives passed the measure and at the next session the Senate enacted it, with only a few negative votes (Under these circumstances the Governor had no veto). "*The Literary and Botanical-Medical Institute of Ohio*" was thus incorporated on the ninth of March, 1839. Its medical department was opened in Columbus the next autumn under the imposing title of *The College of Physicians*.

Dr. Curtis did not differ much from Dr. Thomson. He insisted upon his own authority and his right to judge and often lectured his associates magisterially for what he considered their derelictions. While he insisted upon establishing his own school, he was very hostile to others establishing theirs. In 1846, after one of his orations on this question, he actually proposed that all the other schools should sell all of their property and merge their funds into one strong institution. For this institution he very generously offered himself as Chancellor.

In 1841 the institution was moved to Cincinnati by legislative permission. In 1859, the Physio-Medical Institute was organized and existed as such until it was finally suspended.

The abandonment of the *Western Medical Reformer* was in many ways a mistake, for it kept the school in contact with the alumni and friends of reformed medicine, thus assuring more students, at a time when the country was in the depths of one of its worst depressions. However, badly as it was needed, its expense could apparently not be met.

In the meantime Alva Curtis, down in Columbus, had gathered the enemies of the Worthington Medical College around him and his Botanico-Medical Institute of Ohio. The *Western Medical Reformer* was as badly needed as a medium in which to defend the school and its faculty.

Of these early men of the Reformed School, Dr. J. M. Scudder, a more recent leader of Eclecticism, said, " They were very war-like, pugnacious as snapping turtles, but they had abundant cause for it; they were Ishmaelites and every man's hand was against them and they were inclined to turn their hands against other people." [10]

In the '40's when both Curtis and Morrow had removed their schools to Cincinnati, times were better and the *Western Medical Reformer* was revived. As the two grants were struggling it out, we can get some idea of the quality of these contests by the following: [11]

We find a long article, occupying nearly two and a half pages in the Recorder over the signature of J. C. Bennett, the principal objects of which

[10] Felter, *op. cit.*

[11] See footnote 9.

seems to be a systematized attempt to injure my standing and character by informing the public that he in his celebrated two diploma peddling in 1833, conferred one of his spurious degrees on me, alleging now that he thinks that it was 'undeserved' evidently because it is yet 'unpaid for.'*

It is true he was about Worthington, Ohio, two or three days, or parts of days in the fall of 1833, when I saw him as above stated, but I was fortunate enough to have avoided his company. The object of his visit to that place, as I afterwards learned, was to try to sell as many diplomas to students of Worthington College as he could. . . .

Cincinnati, August 27, 1845

I hereby certify that while I was attending the Medical Department of Worthington College as a student in 1833, that John Cook Bennett visited that place and induced a student of Medicine by the name of DeLathule to purchase a diploma from him at the price of Ten Dollars, and that said student left immediately, after having been there but a few days and having barely entered the rudiments of his study. DeLathule was a roommate of mine.

—L. E. Jones, M. D.[19]

Dr. Morrow then quotes from a letter from his colleague likewise honored with one of these two diplomas. Under date of August 22, 1845:

In regard to the notorious John Cook Bennett, my recollection entirely acceeds with your own. You no doubt recollect that we knew nothing of his issuing diplomas till he had left Worthington and then it was we wrote him the letter. We not only did not pay him but felt that we had been insulted and so wrote him. You doubtless recollect that I went down to Columbus after the passage of his College bill through the House and put the Committee

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* "Now I never conferred the Degree of the Doctorate of Medicine illegally in my life and I am not aware that I ever conferred more than one that was undeserved and that one which is yet unpaid for was that of Thomas Vaughan Morrow." (Alva Curtis, "The Eclectics vs. Dr. Bennett" (Editorial). *Botanico-Medical Recorder*, 1846: 13, p. 307.)

[19] Lorenzo Eldridge Jones, M. D. joined the faculty of Morrow's Cincinnati School the year before. His biographies give an insight into his cooperation in the above matter when he wrote, "How he would dwell on the virtues of *Allium Cepa* or Nepeta Cataria. And then how he would worry calomel, batting it now hither, now yonder, now up, now down, until one verily believed the devil was dead. When mercury no longer required so much cuffing, he felt the devils were out of joint.

But our old friend is gone where sin and sorrow, mercury, and arsenic will trouble him no more."—Dr. Scudder at the time of Dr. Jones' death (Quoted by Felter, page 93).

of the Senate on the alert, of which the Honorable Julian Hitchcock was Chairman, from whom the report which you have emanated.

This same Bennett through the beautiful system of advertising for professors, succeeded by the aid of some party postmaster, in obtaining a chair in the Willoughby School of Lake Erie, from which he was SANS CEREMONIE shortly after ousted. Judge Allen was a member of the House, when he (Bennett) tried for his Scioto School but did not know afterwards that he was the same fellow who had wormed himself into their school *till I told him of it. He immediately procured the legislative documents and sent them home and to save the trouble of replying* to any squibs from him (Bennett) had then shown to him and asked him to resign and he (Bennett) did so. To avoid detection, he had previously to and after his appointment signed his name J. C. Bennett instead of John Cook Bennett, M. D., L. C. D., as he had previously done.

We afterwards ascertained that Bennett had filled out two of his diplomas, one with my name and another with the name of one of my colleagues of the Faculty without the knowledge, consent, or solicitation of either of us, and deposited them with an individual then residing at Worthington whose cooperation and confidence to some extent he (Bennett) had unfortunately secured—with instructions that they should be delivered to us afterwards, which was accordingly done after Bennett left the place. . . .

I was first at a loss to know what could have been the object of this dispenser of diploma favors, but I soon afterward learned that he was in the habit of referring to this circumstance as an argument to induce others to consent to purchase his diplomas, stating that he had conferred them on the Professors of Worthington College & &.

This confirms the opinions expressed in the Waite paper [13] on the New Albany School: "A polemical editorial controversy arose in 1845 between the editors of the two sectarian medical journals in Cincinnati. Dr. Bennett was then teaching in the medical school represented by one of these journals and his name entered the controversy. The editor of the journal representing the other medical institution printed in a 'communication' from a correspondent the following reference to Dr. Bennett: 'I allude . . . to that notorious personage, who in 1833-4, traveled through New York, the north of Pennsylvania, and Ohio, and peddled his New Albany diplomas to every ignoramus who could raise ten dollars to buy one. I know

[13] Waite, Frederick C., Ph. D. "The First Diploma Mill in the United States," *Bull. History of Medicine*, 1946: 20, No. 4. pp. 495-504.

many who did buy these although they were not worth a cent. He filled the diplomas and peddled them out.' "

Beginning auspiciously in full public favor at Worthington, the college early got such a popular hold that a "regular" doctor, Kingsley Ray, M. D., whose principal claim to fame arose from the fact that he himself carried the first quinine into Columbus in 1824, was forced to shift the scene of his work from the village, and other regulars did not dare to try to locate there.

In the autumn of 1839 a Mrs. Cramm of Marietta, Ohio, died in the State Lunatic Asylum then located at Broad and Washington Streets in Columbus. Owing to the deep mud in the roads her relatives did not arrive in time to claim her body and it was buried in the potter's field in the old graveyard near High and Vine Streets where North Market now stands. When the family arrived they found her grave empty. Two other graves had been disturbed and suspicion pointed to the Worthington Medical College.

Shortly after this a rumor reached Worthington that a body of armed men was on its way from Delaware to search the college for bodies. President Morrow, the faculty, the students and the friends of the college armed themselves with pistols and shotguns and every kind of firearm that they could procure, and fortified themselves in the building.

The mob arrived. A lawyer named Thomas W. Powell from Delaware made an inflammatory speech. The infuriated mob rushed into the President's office and into his residence to search them. They found nothing there, but in a corn shock back of the college building, they did find the body of a Negro. This maddened them still more.

Battering rams were improvised and made ready for use. A pitched battle was about to begin when someone gave the keys of the college building into the hands of the mob. Morrow, seeing that resistance was useless, offered to surrender and close the college provided the faculty be allowed to take all movable property. The request was granted and the Worthington Reformed Medical College was closed.

The Legislature on March 20, 1840, passed an Act to amend an Act entitled:

An Act to establish a college in the town of Worthington. Section 1. Be it enacted by the General Assembly of the State of Ohio that, so much of the first section of an Act entitled, an Act to establish a college in the town of Worthington, as may be construed as to authorize the trustees of said college to confer medical degrees, be, and the same is hereby repealed.

—Thomas J. Buchanan
Speaker of H. R.

Wm. McLaughlin
Speaker of Senate

Morrow removed the school to Cincinnati where it became the Eclectic Medical Institute of Cincinnati. Wooster Beach himself joined the faculty. Not all of the Worthington Faculty went with the school, for in the graveyard of St. John's Church lie the bodies of Jonathan Robert Paddock and Benjamin Franklin Johnson.

For a time, no use was made of the College building. People believed the place haunted. They told stories of lights seen in the basement and of strange and uncanny happenings thereabouts no doubt performed by those spirits whose bodies had been cut to pieces in the dissecting room by the medical students.

Finally the building was used as a town hall and several private or select schools were held in its rooms. Then the records show that it was rented on numerous occasions for various kinds of shows and entertainments, such as Negro concerts, minstrel shows and panoramas.

The College building and ground were given back to the Worthington School Board in 1870 by the State Legislature and the building was used by the public schools at the next session.

THE FIRST MEDICAL COLLEGE IN VERMONT

FREDERICK C. WAITE

Fifteen medical colleges were founded in the American Colonies and the United States before 1813. Twelve of these were departments of colleges of arts and science, one was founded by a state medical society, one by a district medical society, and one under a state department of education known as the University of the State of New York. Five of the fifteen had succumbed before the end of the year 1817 and one was then temporarily inactive. This left nine institutions in operation at that time, of which four were in New England and two in the adjacent state of New York.

The village of Castleton is located in Vermont about sixty miles north of the boundary of Massachusetts and eight miles from the boundary of New York. The township was one of a hundred and twenty-eight sold between 1749 and 1764, each to a group of men, by Benning Wentworth, governor of the Province of New Hampshire. These were called collectively the New Hampshire Grants. The purchasers were called grantees but when they came to settle upon their lands they called themselves proprietors.

The Castleton grant was made in 1761, with the first permanent settlement in 1770. The town grew rapidly and contained a considerable number of well-educated men, some of them college graduates. They organized an academy in 1786 which has operated continuously and is today the oldest educational institution in the state.

Castleton, in 1818, had become one of the important towns of the state with a population of nearly eighteen hundred people, and several factories. It was favorably situated in a wide valley, agriculturally rich, and with extensive marble and slate quarries near it. Two main stage routes crossed in the village, one from New York to Montreal and the other from Boston to the Mohawk Valley.

The nearest medical college to Castleton was Dartmouth Medical College, sixty miles distant. The three other medical colleges in New England were at Boston, Providence, and New Haven, each

distant more than a hundred and fifty miles. The College of Physicians and Surgeons of the Western District of New York was approximately as far away. These distances seem small in the present day but when stages made only fifty miles a day in good weather, these other medical colleges were at a distance of from one to four days of travel.

Few residents of Vermont attended any medical college before 1818. Only nine had been graduated at Dartmouth Medical College in twenty years and two at Harvard Medical School in thirty years. Almost all medical education in the state was restricted to study under a preceptor. Two physicians in Castleton were favorite preceptors and each continuously during many years had several private students.

Four basic reasons appear from what has preceded for the founding of a medical college at Castleton in 1818. These are: the favorable location of a prosperous town on main avenues of communication, the remoteness of other medical colleges, the considerable number of private students attracted by two local physicians, and the existence of a prosperous academy in the town. To these may be added the facts that the population of the state was rapidly increasing and that the citizens of the town had a definite interest in cultural affairs as shown by the existence of a local lyceum and a vigorous debating society.

One of the founders wrote ten years later that the purpose in establishing the new institution was to provide a better medical education than was afforded by the preceptorial method under physicians in remote villages.

The founders were three local physicians: Selah Gridley (1770-1826), Theodore Woodward (1788-1840), and John LeConte Cazier (1790-1863). The previous and subsequent careers of these three men show each to have been a skillful physician and a capable teacher.

They signed an agreement early in February 1818 to organize a medical college. The original manuscript has been preserved and four of its features deserve comment. The name was to be Castleton Academy of Medicine, the first use in the United States of the word "academy" in the name of a medical teaching institution. The

name was changed to Vermont Academy of Medicine in 1822 and so continued until 1841. This nomenclature has led several writers to confuse the institution with the Vermont Medical Society.

The founders called themselves "proprietors" in the document, a term undoubtedly derived from its common use by the settlers of the region, as already mentioned. The word "proprietor" does not occur in connection with any earlier medical college. Later all privately owned and operated medical colleges were called proprietary and the use of this adjective throughout the rest of the nineteenth century in medical education can be traced to the use of the word in this agreement, and further back to land speculation in New England in the eighteenth century.

The founders agreed to pool their personal libraries and add to them to make a library housed in the medical college building, available to all students, from which books might be borrowed for limited periods of time. They also agreed to provide apparatus for demonstration in anatomy, chemistry, and materia medica. This is an early record of a medical college library.

The document provided for a continuous session of the medical college throughout the calendar year, the first record in the United States of continuous institutional medical teaching, the details of which will be explained later.[1]

A prospectus, dated February 5, 1818, announced the college's opening on February 25 with courses in anatomy, physiology, chemistry, surgery, obstetrics, institutes and practice of medicine, and materia medica. The session extended probably for twelve weeks.

The legislature of Vermont granted a charter on October 27, 1818. Through inadvertence in drafting the bill the charter did not give the power to grant degrees, a failure remedied by an amendment passed October 29, 1819. The incorporators of Castleton Medical Academy organized as a board of trustees on December 8, 1818.

The lack of power to grant degrees promised to inhibit attendance and therefore a loose affiliation was made with the neighboring

[1] Frederick C. Waite, "Birth of the First Independent Proprietary Medical School in New England, at Castleton, Vermont, in 1818," *Annals of Medical History* (New York, 1935), New Series, vii, 242-52.

Middlebury College in August 1820 under which the medical degrees were voted by the trustees of Middlebury College until 1827, although the separate Board of Trustees of the medical college had authority to grant degrees after October 1819.[2]

Dr. Gridley and Dr. Woodward purchased in February 1818 a building that had been used as a law office and the instruction was given in this building until 1821 when a medical college building, commodious for its time, was erected on a different site. This building is still in use for educational purposes. The medical college occupied it until its close in 1862. It was unused during three years until removed between 1864 and 1867 to the campus of the Castleton Academy, now the Castleton State Normal School.

The medical college at Castleton has to its credit a number of "firsts" in medical education. Some of these have been mentioned. It was the first independent medical college in the United States being, in 1818-19 and after 1827, independent of any college of arts, medical society, or state department of education.

It was the first medical college to be in operation throughout the calendar year. The year was organized into four sessions, each of twelve weeks. One of these was called the lecture term in which lectures were given for thirty hours a week in the several departments of medicine. The other sessions were called reading terms, in which daily recitations were conducted by resident members of the teaching staff, supplemented by occasional lectures. Opportunity was given for human dissection and also for visiting patients with a physician. Fewer students were in attendance in the reading terms than in the lecture terms but at times this smaller attendance exceeded thirty students. The fee was one-fourth that of the lecture term. The reading terms provided the kind of instruction commonly given by preceptors when their students returned to them between lecture terms. The instruction had better facilities and teachers superior to the average preceptor in a country village. The plan of reading terms, first offered at Castleton, was adopted by several other medical colleges.

The medical college at Castleton was, as far as I have found, the

[2] Frederick C. Waite, "Three Episodes in Medical Education at Middlebury College (1810-1837)," *New England Journal of Medicine* (Boston, 1932), 206: 729-35.

first to consider that it had an educational duty to those in the community who did not plan to enter medical practice. The lectures in several subjects were opened to the lay community for a small fee, reduced one-half for women. These lectures were usually given in the evening and included the subjects of botany, chemistry, geology, mineralogy, physics, and physiology, subjects taught in all medical colleges of that era. Lectures in anatomy were not open to women. These lectures were attended by bankers, clergymen, druggists, lawyers, merchants, and teachers of the town and by the older students in Castleton Academy. This educational contribution was later adopted by many country medical colleges and by a few urban institutions.

The teaching staff was large for a country medical college. The three teachers in the first session soon increased until there were usually seven teachers in each lecture term. While the membership of the Board of Trustees was definitely local, the reverse was true of the teaching staff. At all times two, and in some periods three, of the professors were local practitioners but, like all country medical colleges, much dependence rested upon visiting professors who were resident in Castleton during only the lecture term. Forty-eight different men held professorships during the life of the institution of whom eight were resident practitioners. Five of the teachers of botany, chemistry, geology, physics, and medical jurisprudence were not physicians.

The visiting professors were residents of Albany, Boston, New Haven, New York City, Philadelphia, and some smaller cities. Capable men were attracted to the faculty, many of whom served previously, coincidentally, or subsequently as professors in other medical colleges. Some of them gained wide reputation in medical education of the nineteenth century.

The curriculum was that usual in that era, consisting primarily of lectures supplemented by weekly quizzes. Demonstrations were given in anatomy, chemistry, physics, pharmacy, materia medica, and gross pathology. Microscopical demonstrations were given in the last six years. Medical patients were shown before the class and surgical operations were done in the amphitheater when available. This irregular clinical teaching was a part of the instruction

from the beginning. Dissection was carried on and brought many incidents related to procuring of cadavers.

A new policy in medical education was inaugurated in 1835 when two lecture terms were given in each calendar year with graduation of two classes. These lecture terms came in the spring and fall. This was continued, with the exception of the four years from 1838 to 1841, until 1859 when the plan was abandoned after the American Medical Association had expressed disapproval of it. The plan, followed by only a few regular medical colleges, was extensively adopted by sectarian colleges.

Dr. Woodward, the leader since 1822, was compelled to retire because of ill health in 1838. At the same time two professors resigned to found a medical college at Albany. As a result no instruction was given in 1838 or 1839. The institution was revived in 1840 under leadership of Joseph Perkins and soon was again highly prosperous. The name was changed in 1841 and therefore the institution had three successive names, namely: Castleton Medical Academy (1818-22), Vermont Academy of Medicine (1822-41), and Castleton Medical College (1841-62). This succession of names of the same institution has confused some writers.

The students came from all the states of New England, Vermont predominating. The proximity to New York brought many students from the eastern counties of the state. Students came in smaller numbers from all states north of the Mason and Dixon line and westward to the Mississippi River. The southern states furnished a few students. This was the first American medical college to attract any considerable number of students from Canada. They came mainly from what is now Quebec and were of both English and French parentage as indicated by their names. The institution achieved early success, and in its sixth session had an attendance of one hundred and twenty-six which increased in a few years to about one hundred and fifty students.

The total number of graduates in course was over fourteen hundred. Every medical college of that era was liberal in granting honorary degrees of Doctor of Medicine. The institution at Castleton granted one hundred and seventy such degrees. Adding these to the degrees in course makes about sixteen hundred medical degrees granted at Castleton from 1820 to 1861 inclusive.

One should not omit the service in medical education to those who attended one session but did not return for a second session and to receive a medical degree. The names of 1,284 such men are known to have attended at Castleton. This list is not complete due to lack of a complete file of catalogues. Of the names known a total of 505 went to some other medical college and received a degree of Doctor of Medicine.

The total number of non-graduates approaches fourteen hundred. These, added to those who received degrees, make a total of about three thousand men to whom this institution had medical relations. Approximately twenty-five hundred of them are known to have practiced medicine.

They went to all parts of the United States and Canada and a few to foreign countries. Records of them have been found in every state of the Union. They were especially numerous in Ohio, Michigan, Indiana, Illinois, Iowa, Wisconsin, and Minnesota. The medical practice of the entire Middle West was influenced by those who had studied at Castleton. Many reached positions of eminence in medicine. About twenty-five of them became professors in medical colleges.

The decline of Castleton Medical College began in 1856 when Joseph Perkins, who had been its capable leader for sixteen years, resigned to join the medical faculty of the University of Vermont. The decline was gradual until 1862 when this institution, like many other medical colleges, became a casualty of the Civil War.

Three country medical colleges had a large influence upon medicine of the nineteenth century and were patterns for many other country medical colleges. These three were the College of Physicians and Surgeons of the Western District of New York (1812-1841), Berkshire Medical College (1823-1867), and the institution at Castleton. The history of none of these three has been published. The author of this paper is writing a detailed history of the medical college at Castleton which is planned for publication early in 1948 by the Vermont Historical Society.

PIONEER MEDICINE IN THE SOUTHWEST

LEWIS J. MOORMAN

When arboreal vitamins became scarce and our Simian forefathers came down from the trees and decided to wrest a living from the soil, man's pioneering spirit was born. Hooten has said that the first "human declaration of independence was signed at the foot of a tree." We do not know when the first prescription was written, but the spirit of pioneer medicine has varied with geographic, climatic, and other environmental conditions.

The physician's lot among the settlers on the last free land in the United States differed little from that of William MacLure at Drumtochty, Frances Adams at Banchory, William Withering at Stafford, or the indomitable pioneer physicians in colonial days who established American medicine along the eastern seaboard. It was much like that of the sturdy pioneers who brought their equipment across the Alleghenies on pack horses to establish the medical department of Transylvania University, and it may be said that in the relatively new southwest our lot was not unlike that of the physicians who followed the Connecticut Land Company to help settle the Western Reserve thus making it possible for us to stand here this afternoon.

When in the course of civilization on this continent our people traversed the timber clad lands and came out upon the great plains, they passed from the log cabin to the dugout and the sod house. Edward Everett Dale, Research Professor of History at the University of Oklahoma, suggests that this example of innate ingenuity represents a fundamental Americanism.

> The cultural and economic pattern which, broadly speaking, is the life of the people of any region, grows from certain distinct roots. Some of these, as climate and geographic conditions, lie close beneath the surface while others are deeply rooted in the subsoil of history. From these grows a pattern of life which reaches full flowering and eventually produces fruits. It would seem that if these fruits produced by various regional cultures could be gathered and placed in a great wine press and the juice could be extracted,

the resulting brew would have certain distinct qualities. For in it one might find the wholesome but slightly acid touch of puritan New England, the mellow sweetness of the old south, the substantial body of the middle west, the wild, raw tang of the great plains and Rocky Mountain plateau, the peculiar spiciness of the Spanish southwest, and the exotic flavor of the Pacific Coast all mingled in the peculiar blend that we call Americanism which, lacking any of these elements, would not be the same.

Truly American medicine would not be the same without the wild raw tang and the Spanish spiciness of the southwest.

Throughout this region wherever the white doctor came, he found the Indian medicine man in spectacular habiliments singing, dancing, drumming, and rattling evil spirits away. By thus exorcising the evil spirits and placating the gods, they inspired confidence and favored recovery, or when death became inevitable, they smoothed the way to the happy hunting ground. Though the Indian medicine man on the plains employed scarification, steam baths, cold plunges, and many herbs including the merciful peyote, the sick Indians chiefly relied upon the noisy incantations of their medicine men who were held in such high esteem. Of the many herbs they used, fifty-six are included in the United States Pharmacopoeia. When we question the Indian medicine man's methods, we should remember that the Indians had relied upon them implicitly for eons before the Great White Father attempted to supplant these methods. Also, we should remember that we have had five hundred million years of intuition and only one million years of intelligence and that unimpeachable wisdom has not yet evolved. In Hermann Bloch's *The Death of Virgil*, the author represents the dying Virgil as saying to Augustus Caesar's court physician, Charondas, "Is there any healing at all without magic?"

The Indians were inclined to think they were stronger and more capable before the white man came. No doubt this was due to the fact that the law governing the survival of the fittest eliminated many of their children before they were twelve years of age. Naturally those who survived had a high average of physical competency. The transition from their aboriginal habits to the life of the white man has been a difficult one. They used to move away from their accumulated filth, but now they live in houses, and while still teepee-minded,

they cannot strike camp, fold the skins, assemble the lodge poles, pack the ponies, and move on to a new dwelling place. It is true that the Pueblos and the Hopis lived in houses, but the direct rays of the torrid sun and the dry desert air helped to sterilize their premises. In this connection, I am reminded of the old Indian brave, who in the early days in Oklahoma had to be hospitalized. The first day of his confinement, one of the hospital orderlies found him anxiously walking the corridor. When told to remain in his room, the old brave said, " I want to go out by tree." The orderly said, " Come with me, I'll show you where to go." After being shown the well known accommodations, he said, " H'm, I ain't never done that in the house yet and ain't goin' to now."

Even at the turn of the last century, physicians who helped develop the remaining free land in the otherwise great American Desert found the Indians clinging to superstitions and healing practices not unlike those Hippocrates repudiated when he tried to free his profession from the domination of magic and religion. Today, with few exceptions, the Indian will accept hospitalization and modern medical care, yet his fears and superstitions linger. This tradition covering only a few decades corresponds to the progress of twenty-five hundred years as shown by medical history. Obviously pioneer physicians on the plains in the past fifty years have caught up with other communities in America having three hundred years of medical traditions.

Recently, I had a young Osage woman under sanatorium management. She was well educated and willing to follow the established regime. At her bedside were all the current books of the Book-of-the-Month-Club, Thomas Edward Lawrence's *The Seven Pillars of Wisdom*, and the Holy Bible, yet she was having her beautiful long braids cut off in order that her mother and father might offer them in flame to the great spirit. She was not sure this would hasten her recovery, but her less civilized mother and father considered it a necessary sacrifice and she made the offering in line with duty. No doubt her acquiescence was conditioned by the primitive urge to appease the Indian's God. In the *Medical Story of Early Texas*, Pat Ireland Nixon discussing the Indian's resignation when death approaches, tells of an Oklahoma Indian in a San Antonio hospital in

need of an amputation. The advisors of his tribe traveled from Oklahoma to San Antonio and after due deliberation, they ruled against the amputation of his leg. "Of what use would an Indian brave be in the Happy Hunting Ground with only one leg." As further evidence of the Indian's belief in the supernatural, we report the experience of Amos Chapman, one of the veterans at Fort Supply, Oklahoma, who lost his leg at the Buffalo-Wallow fight. He attended a big Indian powwow where many of the Cheyennes were present. Conscious of the unfriendly attitude of the Cheyennes, he realized that something must be done to establish his superiority. Realizing that he was among strangers and that his trousers leg concealed his artificial limb, he walked up to the big kettle of boiling soup and thrust his leg in the caldron and after stirring vigorously withdrew it and walked away. Immediately the Cheyennes grunted, "Heap big medicine—no burn leg." If time would permit, many interesting experiences in the medical care of the Indian could be related. Some of the early day doctors were paid for services in wood, wild turkeys, venison, and tanned skins.

As early as 1878, the Commissioner of Indian Affairs required further appointees for medical care of the Indians to be "graduates of some medical college and have the necessary diploma." Before this time, false claims often led to the employment of unqualified so-called doctors who failed to inspire confidence and the Indians, though forced to accept medical care, often reverted to their old beliefs and practices upon the slightest provocation. Apparently the first permanent Indian hospital was established in 1882. By 1888, there were four and only five were in operation at the turn of the century. In 1900, there were 86 government physicians, 25 nurses, and 21 field matrons in the Indian service. Gradual development with increasing appropriations progressively supplied better medicine to the Indians and helped bring smallpox, trachoma, and tuberculosis under control. Objections to the methods of the Great White Father were gradually overcome.

Among the first of the agency physicians in Oklahoma was Dr. Charles Robinson Hume, a graduate in medicine from the University of Michigan. In December, 1890, he assumed his duties with the Kiowa, Comanche, and Wichita Indian Agency at Anadarko. He

held this appointment until 1902. He and the Army Surgeon at Fort Sill were the only doctors on the reservation for more than five years. Later, Dr. Givens located at Anadarko. On one occasion, a smallpox epidemic broke out and a Mrs. Cleveland, still living, then a child of six years at the Darlington Agency, had the only known vaccination scab in that section of the country. She was taken to Anadarko and from her scab the necessary vaccinations were made. Because the Indians had been on the warpath for a few weeks, a troop of soldiers from Fort Sill escorted the young lady back to her home in Darlington. That this precaution was warranted is attested by the fact that the girl's parents soon after this incident moved to Anadarko. On the way they passed a charred wagon camp and learned that Indians on the warpath had wrecked the camp and burned Pat Hennessey (for whom Hennessey, Oklahoma, was named) strapped to a wagon wheel.

On one occasion Dr. Hume found the Indian Chief Ta-Ho very ill in his teepee resting on a grass bed. After having tried several medicine men without experiencing improvement, the old chief wanted Dah-Va-Ca, one of the most famous of the medicine men. Dah-Va-Ca came and after much occult ceremony and a few passes with his hand under the cover, he pulled out a small possum and stated that it came from the patient's side. Chief Ta-Ho immediately improved and made an uninterrupted recovery. In the presence of such a spectacular alleged healing power, it was difficult for the Agency doctors to establish medicine in the minds of the Indians.

After considering the aborigines, we must think of Texas under five flags. We hurriedly pass the Spanish period in the southwest which began in 1528 when Cabeza de Vaca took refuge from shipwreck on Galveston Island. He and his companions wandering in a strange land soon came in contact with the aborigines. True to their love of mystery and their "yen" for the supernatural, the Indians accepted his presence as an extraordinary event and insisted that he assume the functions of the medicine man. He acquired experience in the ways of the Indians and became very bold in his application of the healing art. Nixon, under the title, "First Surgical Operation in Texas," quotes Haniel Long's account of de Vaca's operation as follows: "I treated a man who some years since had

been shot through the left side of the back with an arrow. He told me the wound made him feel sick all the while. I observed that the head of the arrow lay in the cartilage. I prayed for an hour, and then grasped the very sharp thin stone which served me as a knife, and cut open the breast. Feeling the arrow-head, I thrust my hand into the palpitating tissue of the body. Your Majesty, that we human beings should be made of limp wet meat appeared to me as strange as that we should be also air and spirit; and in that hour nausea and a quick curiosity mingled with my pity." This was nearly 100 years before Jamestown was founded.

After eight years among the Indians, Cabeza de Vaca and his companions returned to Mexico City. It is stated that he found it difficult to take up again the customs of civilization, particularly that of wearing clothes.

In 1540 Coronado with a colored guide who had been one of de Vaca's shipwrecked companions traveled through Texas and Oklahoma and into Kansas in search of the seven golden cities of Cibola. Coronado's trip is of interest to us because he was accompanied, presumably, by a qualified physician and surgeon. If so, this was the first physician to enter the southwest and he was on the ground approximately seventy years before John Smith of Jamestown had to take ship for England in order to secure medical care for his powder burns. These excursions into the otherwise unknown region of the southwest initiated Spanish claims to that territory north of the Rio Grande, later to become the hotly contested Republic of Texas. There is a long and richly colored story of Spanish occupation, Spanish diseases, and religious influences. The introduction of smallpox proved to be the greatest curse suffered by the susceptible aborigines.

Finally, Spanish physicians came and hospitals were established. The first, in the Alamo, was founded as early as 1805. The development of medicine and hospitals and the record of the Spanish ruler's interest, knowledge, and solicitude at this time is most interesting. Both vaccination, and caesarian section in women dying close to term, were urged by royal decree.

The Spanish rule was interrupted by Mexico's conquest in 1821. Before the era of American colonization in this area, there were

French and Mexican occupations, each with its racial diseases and its thwarted attempts toward effective medical care.

With the coming of American pioneers, we find American physicians with native ingenuity and relatively high scientific attainments. At least seven out of the 59 men who signed the Texas Declaration of Independence were doctors. They were heroic at the seige of the Alamo; Pollard, Thompson and Michison were on duty to the end giving comfort and relief to their companions for whom they made the last great sacrifice. Drs. J. W. Shackelford and Joseph W. Barnard participated in the Coliad campaign resulting in the treacherous massacre of the 400. Shackelford and Barnard were spared to dress the wounds of the Mexican survivors. The revolutionary physicians were at San Jacinto to sharpen the revenge of the outraged Texans. It is recorded that sixteen physicians participated in this battle and, according to Albert O. Singleton, one of them, Dr. Anson Jones, played a great part in the making of Texas and was called the architect of annexation. He was the last President of the Republic of Texas. Courageously the physicians of Texas pursued their course caring for the sick in the wild outlying communities and initiating medical organizations. At the same time, many of them were seeking advanced knowledge from abroad, some going for postgraduate study while a few were making valuable contributions to medical lore. As medicine progressed, hospitals were developed and medical education was being discussed with a view of equipping young men for practice in the south. Periodically there were discussions regarding the regulation of practice, and regulatory measures were successively adopted and for a long time indifferently enforced. The Texas State Medical Association was organized in 1852. The Medical Department of the State University was established at Galveston in 1890. Today, there are three recognized medical schools in the State of Texas.

Aside from the Spanish, French, and Mexican influences, medicine in Oklahoma has been much like that in Texas, though its course has been less stormy, less romantic, and much less dangerous than when Texas was fighting for independence. The development of hospitals, clinics, medical education and research in Oklahoma has been relatively rapid. Early in the history of the two territories organized

medicine was represented by the Oklahoma and Indian Territory Medical Societies. When joint statehood was achieved in 1907, these two societies united to become the Oklahoma State Medical Association. The University of Oklahoma School of Medicine was founded in 1910. The Oklahoma Medical Research Foundation was established in 1946. The horse and buggy doctor throughout the great southwest crisscrossed the pioneer trails making it possible for early day settlers to live in dugouts and sod houses in relative safety while they transformed the great American Desert into the world's bread basket. Many of these doctors were ambitious young men from the best medical schools in America seeking opportunity and adventure. Thus scientific progress and good care for the pioneers traveled hand in hand. Medical societies, hospitals, clinics, public health agencies, university medical schools and postgraduate facilities, clinical and research laboratories were gradually developed.

But before Texas became a republic and long before Oklahoma was settled, American pioneer medicine in the southwest was assuming the role of comedy and tragedy along the far flung arteries of commerce where the trader, buffalo hunter, and the Indian scouts served as middle man between civilization and the fighting plains Indians. The Santa Fe Trail was established in 1822 and wagon trains were going through by 1824. The caravans on the trails often carried interesting characters and inspired some of the best historical writing of that period, and these stories supply many of the earliest available facts about pioneer medicine. One of the best known of these writers was Francis Parkman whose story, *The Oregon Trail*, contains interesting medical facts, but of greater interest to us is Josiah Gregg's *Commerce of the Prairies*. In the original preface, Gregg says,

> For some months preceding the year 1831, my health had been gradually declining under a competition of chronic diseases which defied every plan of treatment that the sagacity and science of my medical friends could devise. This morbid condition of my system which originated in the familiar miseries of dyspepsia had its kindred infirmities and finally reduced me to such a state that for nearly twelve months I was not only disqualified for any systematic industry, but so debilitated as rarely to be able to extend my walks beyond the mere precincts of my chamber. In this hopeless condition, my physicians advised me to take a trip across the prairies and in the change of air and

habits which such an adventure would involve, to seek that health which their science had failed to bestow. I accepted their suggestion without hesitation and proceeded at once to make the necessary preparation for joining one of those spring caravans which were annually starting from the United States for Santa Fe.

Apparently suffering from tuberculosis, Gregg was placed in a light open wagon, with tarpaulins for a bed. Obviously he could not escape the fresh air and sunshine, and rest was assured by the physical limitations of the small wagon-bed. These influences plus the buffalo and venison steaks constituted ideal management for tuberculosis. But Gregg's progress must have been remarkable, since it is reported that he was riding with the buffalo hunters long before they reached Santa Fe.

Lewis H. Garrard in *Wah-To-Yah and the Taos Trail* says " Many employees were afflicted with the scurvy, a disease brought on by great change from their usual diet to superfine flour and fat pork. First, the tendons under the knees contract, the leg mortifies; the patient lies and limps around camp, at the same time possessing a morbid ravenous appetite for strong foods; dysentery reduces him to mere skin and bones and he dies. His body revolting to the sight is rolled in blankets and the unclean mass thrust hastily in a mere hole only to be disinterred and gnawed by wolves. Dependent on themselves for medicine they suffer much." Stanley Vestal in the *Old Santa Fe Trail* says " The grocer would sell every man his necessary ration of 50 pounds of flour, 50 pounds of bacon, 10 pounds of coffee beans, 20 of sugar, and a small quantity of salt." In another paragraph, he says " Scurvy was a great curse on the plains for greenhorn soldiers and all who lived upon the superfine flour, salt pork, and even red meat. The medical science of those days prescribed lime juice and dried fruit, never taking any account of the fact that Indians and mountain men who lived upon nothing but meat most of the year never suffered from scurvy.

" The rare greenhorn who was curious and enterprising enough to ask questions was likely to be read a hard sermon on the concise text, meats, meat!" For the benefit of the greenhorn or tenderfoot, the old timer would expatiate on diet, " Panther meat, then beaver tails boiled, unborn buffalo calves before they hair over, rattlesnakes

like a long chicken neck only whiter, skunks, and goats. Then there is buffalo, I mean the whole critter, mind you, barring hide, hair, horns, and hoofs. Red muscle meat will do you in the settlements, maybe so where you can get plenty of greens and vegetables. But on the prairie you will have the cow's insides for choice marrow, lights, heart and tongue, warm liver spiced with gall, and best of all, guts—plain guts—and raw at that!" . . . "Who do you think is best judge of meat anyhow? Them as eats a little piece cut across the grain, burned in a pan once a week, or them as eats nothin' else and all kind the year 'round as often as they can get it?"

Vestal goes on to say

> The train had no surgeon. Physicians seldom ventured from the settlements. Those who went were commonly so incapable that travelers usually preferred amateur treatment by experienced traders and mountain men, or placed themselves when possible in the care of Indian medicine men. Most travelers, even soldiers, had to doctor themselves as a rule with the result that gunshot wounds, Indian arrows and lances, typhoid fever, scurvy, smallpox, Asiatic cholera, chills and fever, tuberculosis, and mere exposure left many gaps in the ranks. No one has written the history of frontier medicine and surgery. It would make a thrilling story.

In connection with this discussion of scurvy it is interesting to note that Vilhjalmur Stefansson in the far north was able to live with the Eskimos existing wholly upon raw meat, fish, and blubber without any impairment of physical well being. In the March 24, 1947, issue of *Life*, under the title "The First Year," Harmon Helmericks and his young bride report their experiences during the period of 26 months beyond the Arctic Circle. They admit that survival would have been impossible if they had not learned quickly the lessons of the Eskimos. "Although they lived almost entirely on meat, they ate both fat and lean, well cooked and raw, and avoided the scurvy which plagued early explorers." Later in the article, they acknowledged the value of Stefansson's experiments in living with the Eskimos. Also, they acknowledged their indebtedness to the Eskimos as their real teachers and frankly admitted that by adopting their habits and customs they were able to keep well.

In *Commerce of the Prairies*, Gregg relates the following interesting stories:

Captain Becknell and his party consisting of thirty men attempted to "steer more directly for Santa Fe . . . across the pathless desert."

Frequently led astray by the deceptive glimmer of the mirage, or false ponds, as those treacherous oases of the desert are called, and not suspecting (as was really the case) that they had already arrived near the banks of the Cimarron, they resolved to retrace their steps to the Arkansas. But they now were no longer equal to the task, and would undoubtedly have perished in those arid regions, had not a buffalo, fresh from the river's side, and with a stomach distended with water, been discovered by some of the party, just as the last rays of hope were receding from their vision. The hapless intruder was immediately dispatched, and an invigorating draught procured from its stomach. I have since heard one of the parties to that expedition declare, that nothing ever passed his lips which gave him such exquisite delight as his first draught of that filthy beverage.

Following up the course of this stream (the Arkansas River) for some twenty miles, now along the valley, and again traversing the points of projecting eminences, we reached Walnut Creek. I have heard of a surgical operation performed at this point, in the summer of 1826, which, though not done exactly *secundum artem*, might suggest some novel reflections to the man of science. A few days before the caravan had reached this place, a Mr. Broadus, in attempting to draw his rifle from a wagon muzzle foremost, discharged its contents into his arm. The bone being dreadfully shattered, the unfortunate man was advised to submit to an amputation at once; otherwise, it being in the month of August, and excessively warm, mortification would soon ensue. But Broadus obstinately refused to consent to this course, till death began to stare him in the face. By this time, however, the whole arm had become gangrened, some spots having already appeared above the place where the operation should have been performed. The invalid's case was therefore considered perfectly hopeless, and he was given up by all his comrades, who thought of little else than to consign him to the grave.

But being unwilling to resign himself to the fate which appeared frowning over him, without a last effort, he obtained the consent of two or three of the party, who undertook to amputate his arm merely to gratify the wishes of the dying man; for in such a light they viewed him. Their only "case of instruments" consisted of a handsaw, a butcher's knife and a large iron bolt. The teeth of the saw being considered too coarse, they went to work, and soon had a set of fine teeth filed on the back. The knife having been whetted keen, and the iron bolt laid upon the fire, they commenced the operation: and in less time than it takes to tell it, the arm was opened round to the bone, which was almost in an instant sawed off; and with the whizzing hot iron the whole stump was so effectually seared as to close the arteries completely. Bandages were now applied, and the company proceeded on their journey as

though nothing had occurred. The arm commenced healing rapidly, and in a few weeks the patient was sound and well, and is perhaps still living, to bear witness to the superiority of the "hot iron" over ligatures, in "taking up" arteries.

Oklahoma and Indian Territories were under separate federal jurisdiction until they united for single statehood in 1907. The regulations governing the practice of medicine in the two territories were poorly defined and indifferently enforced. This was particularly true of Indian Territory which was under the jurisdiction of the Arkansas statutes. As a result, a good many unqualified doctors were admitted to practice in this Territory. To some extent, this laxity may have been encouraged by the need for doctors as the people poured into this area in the 1890's and even at the turn of the century when many thousands came in for the famous land lottery in July, 1901.

Oklahoma and Indian Territories were in the second tier of states west of the Mississippi and this great western migration came about because of the pressure of population in the east, the extension of railroads across the continent and the promise of free land. It may be that the westward trek was influenced by the pioneering spirit of adventure. The first great run for land in Oklahoma was in 1889. The second run at the report of a gun opened the Cherokee Strip in 1893 and finally the more orderly drawing was at El Reno and Fort Sill in 1901. I rolled in on this last restless wave of homeseekers and stood in line with the great throng who registered during the first week of the drawing at El Reno.

This little town of 7,000 people entertained 165,000 visitors during the short period of the Federal land lottery and then cleared away the debris in order to take an important place in the history of the state. Fortunately, I drew an unlucky number and instead of proving up a claim, I purchased a team of Indian ponies on the Washita River from a band of roving Indians and located in the Cherokee Strip, 20 miles from the nearest railroad. There I practiced medicine six years meeting the weather, rain or shine, wind or snow, night or day, season upon season, facing northers, fording streams, and threading the sand hills north of the Salt Fork to the accompaniment of the weird yodeling of coyotes with only the stars

to guide me. Leaving my own career to the reader's imagination I turn to the story of one of my friends who staked a claim near the panhandle of Texas and then went back east to finish his medical education. In 1900, he returned on a borrowed horse to begin the practice of medicine with only promises for the good woman who gave him room and board. The people needed a doctor, but in those days on the middle border there was little money in circulation. His landlady was patient, and after two years he was able to pay because there was a smallpox epidemic. The county commissioners employed him to take care of all who would submit to vaccination. For each person vaccinated, he was to receive $1.00.

His check from the county commissioners enabled him to pay his board, his drugstore account at the nearest railroad station 26 miles away, and to purchase a suit of clothes to replace those he had repeatedly patched with his own hands. As an indication of his newly acquired prosperity, he was able to place a small amount of money in the bank.

As his practice grew, often it became necessary to ford the treacherous South Canadian River. Usually he employed a well trained horse that had learned to negotiate the hazardous quicksand by a rapid goose-stepping and immediately find his stroke when caught in the deep currents. On one occasion while crossing on an untrained horse, he was thrown in mid-stream and stranded on a sand bar with an injured thigh while his saddlebags washed down the river.

After five years of practice, all the time conscious of his limitations, he applied for admission to the Senior Class of the Medical College of Ohio. When matriculation was assured, he still had to negotiate the cost of this additional schooling and the care of his wife and child. Feeling that he had earned the support of his people by sharing their hardships, he appealed to them for the needed additional funds. The response to this appeal far exceeded his expectation.

At the expiration of a year, he returned with renewed confidence and the determination to give to his community the best possible medical service.

Settlers having had time to stock their farms and having learned the art of farming the dry upland soil were rapidly becoming more prosperous. This meant more money for the doctor. In keeping

with his ambition to give better service, he established a small hospital. Unfortunately, the people were not educated to the need of hospitalization and bankruptcy closed its doors. Again he prospered and his three sons, having studied medicine, returned to their home with special training in different fields and helped build another hospital and a great clinic. With this modern plant and their varied skills, they drew medical and surgical patients from large areas in five states and they have passed not only from horse and buggy to automobile, but they keep three planes for pleasure and emergency transportation.

Recently when a devastating storm swept through Texas and Oklahoma, they opened their doors to the crippled and bereft and rendered invaluable services. By converting reception room and corridors into wards, they gave emergency care to 200 of the injured and dying. The one-time doctor on horseback who mended his own clothes while waiting for a break has recently given generously to the Oklahoma Medical Research Foundation. Though it has been said that the age in which a man lives best interprets his work, it is believed that time will at least polish the escutcheon of the frontier doctors who participated in the winning of the west. Fortunately the hardships of the pioneer physican in the southwest were partially compensated by the ease with which he turned from the poverty and pain of his patients to the beauty and poetry of the boundless plains.

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DOCTOR EDWARD TIFFIN, FIRST GOVERNOR OF OHIO

LINDEN F. EDWARDS

One hundred and fifty years ago virtually all of the territory Northwest of the Ohio River was a gloomy wilderness. This vast region, the Northwest Territory of the United States, covered an area as large as that of the 13 original states, extending from the Ohio River on the south to the Great Lakes on the north from the the foothills of the Allegheny Mountains on the east to the headwaters of the Mississippi River on the west, an area comprising the present states of Ohio, Indiana, Illinois, Michigan, Wisconsin and a portion of Minnesota. The history of the settlement and development of this Territory and of its formation into states is of particular interest to all Mid-westerners. Of special interest to those interested in medical history is the fact that four of the leading characters in the history of the Northwest Territory were physicians or had studied medicine. These were first, Manasseh Cutler,[1] agent of the Ohio Company of Associates which made the first legal settlement in the territory at Marietta (Apr. 7, 1788); secondly, General Arthur St. Clair,[2] Governor of the Northwest Territory; thirdly, William Henry Harrison,[3] Secretary of the Territory, its first delegate to Congress, Governor of the Indiana Territory and later President of the United States and fourthly, Edward Tiffin,[3] first Governor of Ohio.

The name of Governor Edward Tiffin is familiar to most native Ohioans. However, amazingly few, including physicians, with whom Governor Tiffin was discussed, are aware that during his day he en-

[1] *Life, Journals and Correspondence of Rev. Manasseh Cutler, L. L. D.* By his Grandchildren (Cincinnati, 1888).

[2] F. E. Wilson: *Arthur St. Clair, Rugged Ruler of the Old Northwest* (Richmond, Va., 1944).

[3] W. Browning: Physicians Who Have Been Governors of Our States, Territories and Colonies. *Western Medical Times*, Vol. XLIII, July 1923. Also *Biographical Directory of the American Congress 1774-1927*, compiled by Ansel Wold (Washington, D. C., 1928).

joyed the reputation of being a skillful and successful pioneer doctor. The chief reason perhaps for the prevailing lack of information concerning the private life of Governor Tiffin is that his distinguished political career completely overshadows all other aspects of his life as recorded in his numerous biographies and in Ohio historical records. The motive underlying the preparation of this sketch of Governor Tiffin is to portray him primarily in the role of physician and surgeon. Evidence will be presented to show that he was a practicing physician from the time he was seventeen years of age almost up to the end of his busy and fruitful life at the age of sixty-three. It is believed there are herewith presented new, documented biographical data most of which were obtained from old newspaper files and unpublished letters and documents under the signature of Edward Tiffin and some of which are not in accord with the published and so-called authentic biographies of Governor Tiffin. Many of his biographers were prone to be more enthusiastic than accurate. Discrepancies abound in his biographies relative to the dates of his birth, of his arrival in America, of his medical training, of his marriage, of his settlement in Virginia and later in the Northwest Territory, as well as concerning various other claims and counterclaims. Time will be economized, however, by avoiding refutation of most of these inconsistent and questionable references to dates and events in his career.

Dr. Tiffin was born June 10, 1766 in Carlisle, England, the seventh of ten children of Henry and Mary Parker Tiffin. He attended the Latin School in Carlisle and on April 1, 1778, at the age of twelve, he was indentured as a student of medicine for a period of five years. In the spring of 1783 he and his parents accompanied by two brothers and two sisters sailed for America in the first passenger ship, the *Mary and Ann*, to leave Liverpool for America following the cessation of hostilities in the War for Independence. The party landed at Norfolk, Virginia and thence went to Alexandria, Va. In October, 1783, being then but seventeen years of age, he began to practice medicine in historic Charles Town, Berkeley County, Virginia, now in Jefferson County, West Virginia.[4]

[4] These biographical data were found in a Chillicothe, Ohio newspaper, *The Supporter* under the date line of June 15, 1811 and were certified by Edward Tiffin and by certain of his relatives and friends.

Several of Tiffin's biographers claim that immediately upon his arrival in America he proceeded to Philadelphia and attended medical lectures at the University of Pennsylvania;[5] others claim that he graduated with honors from that institution in 1786;[6] some state that he attended medical lectures at Jefferson Medical College,[7] while still others claim that he obtained a medical degree from there in 1789.[8] Investigation has failed to reveal his name in the list of graduates of the University of Pennsylvania[9] and the fact that Jefferson Medical College was founded in 1825,[10] just four years prior to Dr. Tiffin's death, eliminates all claims relative to his attendance at that institution. According to Samuel Williams,[11] who was Dr. Tiffin's chief clerk during the 15 years he was Surveyor-General of the Northwest, Dr. Tiffin completed his medical studies in America under a distinguished physician but he couldn't recall his name. In a letter postmarked Chillicothe, Ohio June 15, 1811 Dr. Tiffin stated "In 1783 I finished my medical education and arrived at Alexandria, Virginia that fall."[12] The indenture contract for his

[5] *Biographical Cyclopaedia and Portrait Gallery with an Historical Sketch of the State of Ohio* (Cincinnati, 1883), Vol. 1, p. 158; Biographical Directory of the American Congress, *op. cit.*, 1617; C. G. Comegys: *Reminiscences of the Life and Public Services of Edward Tiffin, Ohio's First Governor* (Chillicothe, 1869)—also in *The Magazine of Western History*, Vol. I, 1885, pp. 236-245.

[6] *Appleton's Cyclopaedia of American Biography*, edited by J. G. Wilson and J. Fiske (New York, 1889), Vol. VI, p. 114; L. S. Evans: *A Standard History of Ross County, Ohio* (1917), 228; Henry Howe, *Historical Collections of Ohio* (Cincinnati, 1904) Vol. II, p. 449; Virginia Lucas, Early Governors of Ohio from Jefferson County, West Virginia, *West Virginia Review*, Vol. VI, 1929, pp. 104-106.

[7] W. E. Gilmore: *The Life of Edward Tiffin, First Governor of Ohio* (Chillicothe, 1897); R. W. Manly: "Edward Tiffin" in F. B. Pearson and J. D. Harlor's *Ohio History Sketches* (Columbus, 1903), pp. 96-102; D. M. Massie: The Governors of Ohio under the First Constitution, *Proceedings Ohio Centennial Anniversary Celebration*, edited by E. O. Randall, Ohio State Archaeological and Historical Society (Columbus, 1903), pp. 238-248.

[8] W. Preston: *American Biographies* (New York, 1940), p. 1016.

[9] Personal communication from W. B. Kennedy, M. D., Assistant to the Dean, School of Medicine, University of Pennsylvania; W. G. Maxwell: *University of Pennsylvania General Alumni Catalogue* (1922).

[10] A. Flexner: *Medical Education in the United States and Canada* (New York, 1910), p. 294.

[11] "Edward Tiffin" in J. B. Finley's *Sketches of Western Methodism* (Cincinnati, 1854), pp. 260-287.

[12] Published in "*The Supporter*," *op. cit.*, 4.

preceptorship signed by Edward Tiffin, Henry Tiffin his father, and Jonathan Creighton of Carlisle, England recently came into the possession of the Ross County Historical Society, Chillicothe, Ohio, where it is now on display, and it substantiates Dr. Tiffin's own statement regarding his medical training.

One of the most persistent rumors, propagated perhaps by his political enemies, was to the effect that Dr. Tiffin came to America during the Revolutionary War as a surgeon attached to General Burgoyne's Army, that he was held prisoner when Burgoyne surrendered and that he chose to remain in the U. S. rather than return to his native England at the close of the war.[13] As Tiffin pointed out in an open letter [14] published in a Chillicothe, Ohio newspaper called *The Supporter*, in which he refutes this slanderous rumor, he would indeed have been a prodigy to have held a commission as surgeon in the British Army at that time since he was only eleven years old.

Dr. Tiffin remained in Berkeley County, Virginia for fifteen years before moving to the Northwest Territory. During this time he married,[15] as the newspapers of that day expressed it, the amiable Miss Mary Worthington, daughter of Col. Robert Worthington, a wealthy Berkeley County planter;[16] he was converted to the Methodist faith during a religious revival and was licensed to preach as a lay minister;[17] he was a popular favorite in the fashionable circles of Berkeley County and was in intimate terms of friendship with

[13] J. Burnet: *Notes on the Early Settlement of the Northwest Territory* (New York, 1847), p. 292; Comegys, *op. cit.*, p. 7; W. E. Gilmore, *op. cit.*, p. 3.

[14] *Op. cit.*, 4.

[15] The Family Bible of Edward Tiffin, Library of the Western Reserve Historical Society.

[16] According to M. K. Bushong: *A History of Jefferson County, West Virginia* (Charles Town, 1941), p. 11; "Robert Worthington, Sr., a Member of the Society of Friends, acquired a tract of 3,000 acres from the Crown in 1730." In Will Book No. 1, p. 197, office of the Clerk of Court, Martinsburg, Berkeley County, West Virginia, is a record (Sept. 18, 1779) of the appraisement of Robert Worthington's estate, the total evaluation of which was £23,352.

[17] According to Samuel Williams, Leaves from an Autobiography, *Ladies Repository*, vol. 12, 1852, p. 460 and Williams, *op. cit.*, 263, "he was received into the Methodist Church in 1790 by the Reverend Thomas Scott—now Judge Scott of Chillicothe—who then had charge of the Berkeley circuit" and was ordained to preach on Nov. 19, 1792 by Bishop Francis Asbury.

the leading men of Virginia,[18] chief among whom were George Washington and Robert Rutherford who was eminent in Virginia politics;[19] he himself had the southerners' talent for politics and had received political appointments including a trusteeship of Charles Town [20] and served as a Gentlemen Justice of the Berkeley County Common Pleas Court.[21] Meanwhile he acquired a reputation for his experience and skill in the practice of medicine. In the *Calendar of Virginia State Papers* [22] is the copy of a certified statement presented by Dr. Tiffin as testimony in a murder trial. It reads in part " this is to certify that I, Edward Tiffin, a practicing physician in Berkeley County, was called upon the 24th day of June, 1786 to visit a Mr. John Crane, Jr. who had that day been seized with fits." Following this statement is another which reads " Doct'r Edward Tiffin who signs the within is considered a good man and practices with reputation." Signed R. Rutherford.

When the Northwest Territory came into the possession of the United States by the treaty of Paris in 1783 its legal settlement was not possible until the rightful claims of the Indians and of several of the states to the territory were relinquished and until the passage by Congress of the Ordinance of 1787 which provided for the establishment of its civil administration.

Among the several states which asserted claims to portions of the Northwest Territory was Virginia, whose claims were founded upon certain charters granted to her by James the First of England, upon the conquest of the territory by General George Rogers Clark during the Revolutionary War, and upon her promise to compensate her soldiers who fought in the Revolution in bounty awards of these lands according to their rank. When Virginia's deed of cession was signed over to the United States (Oct. 1783) she reserved ownership

[18] W. E. Gilmore, *op. cit.*, p. 6; R. W. Manly, *op. cit.*, p. 96.

[19] M. L. Conrade and W. P. Craighill, Robert Rutherford, *West Virginia Historical Magazine*, Vol. 1, 1901, pp. 54-61.

[20] W. P. Craighill, The Old Academy in Charles Town. *West Virginia Historical Magazine*, Vol. V, 1905, pp. 18-33.

[21] Minute Books, Court of Berkeley County, Office of the Clerk, Martinsburg, West Virginia. His name first appeared in the list of Gentlemen Justices on Jan. 21, 1795 and last appeared on Feb. 26, 1798.

[22] Vol. V, p. 497.

of the lands between the Scioto and Little Miami Rivers. The region embraced in this area constituted the Virginia Military District covering an area of over 4 million acres. Each claimant to bounty lands was authorized to select the number of acres to which he was entitled and to have its boundaries, however irregular, surveyed.

Virginians, however, were not attracted in any great numbers to these lands until after the battle of Fallen Timbers (1794) and especially after the treaty of Greenville (1795) when the region appeared safer from depredations by the Indians. In August 1796, Nathaniel Massie, a young Virginia surveyor, had laid out the town of Chillicothe on the west bank of the Scioto River. Within a year's time glowing reports of the fertility of the soil and richness of the opportunities in the Scioto Valley had attracted considerable immigration from Virginia and Kentucky, as a result of which by 1797 Chillicothe consisted of a hundred log cabins, a tavern, several stores and shops, a mill and about 300 acres planted in corn.[23]

In 1796 a group of young Virginians, including Thomas Worthington, a brother-in-law of Dr. Tiffin, journeyed to Chillicothe for the purpose of locating land warrants for their fathers, who had been Revolutionary officers. Upon returning to Virginia in December, 1796, young Worthington, filled with enthusiasm concerning the fertile Scioto Valley and its opportunities, persuaded Dr. Tiffin to journey to that region the following spring. According to the private memoir of Thomas Worthington,[24] he and his sister, Mary Worthington Tiffin, who had inherited a number of slaves upon the death of their father, determined to emancipate their slaves and provide them new homes in the Scioto country. Accordingly Worthington and Tiffin together with several carpenters and mechanics journeyed to Chillicothe in May, 1797 to prepare homes for their emancipated slaves. During this visit Dr. Tiffin likewise became enamoured with the Scioto Valley and the two men decided to move their families there from Virginia. They returned to Berkeley

[23] *Chillicothe and Ross County.* Federal Writers Project. Works Progress Administration. American Guide Series. 1938, p. 11.

[24] Sarah Peter: *Private Memoir of Thomas Worthington, Esq.* (Cincinnati, 1882).

County in the fall of that year and the following spring, March 1798, the party set forth for the Northwest Territory. It included the Tiffin and Worthington families, with their furniture, horses, carriages, wagons and a small army of emancipated slaves. Anna Shannon McAllister in her book entitled *In Winter We Flourish* [25] gives an interesting word-picture of this caravan, and makes this remark " Doctor Tiffin, a stout, florid-faced Englishman, at thirty-two, had already won considerable reputation as a physician and surgeon."

On April 17, 1798, the party arrived in Chillicothe after a hard and hazardous journey of almost one month. Immediately upon his arrival Dr. Tiffin began the active practice of medicine and in addition preached almost every Sunday.[26]

Among the Washington Papers in the Ohio State Library is a letter dated Jan. 4, 1798, addressed to Gov. Arthur St. Clair, and signed by George Washington.[27] In this letter Washington pays high tribute to Dr. Tiffin's character and recommends him to the attention of Governor St. Clair for some official appointment. That the recommendation brought results is evident by the fact that when Gov. St. Clair established Ross County (Aug. 20, 1798) by proclamation and designated Chillicothe as the county seat, he appointed Dr. Tiffin prothonotary or clerk of the common pleas court of that county.[28] This appointment was made just 4 months and 3 days after Dr. Tiffin's arrival in the Northwest Territory.

From that date onward almost continuously for 31 years, until within a little over a month from his death, Dr. Tiffin held some sort of a public office. When Chillicothe was incorporated (Jan. 4, 1802) he was appointed by Gov. St. Clair as a member of the Select Council of that village.[29]

Under the provisions of the Ordinance of 1787 the people of the Northwest Territory of the United States were to assume the legisla-

[25] Longmans, Green and Company, 1939, pp. 10, 11.
[26] Williams, *op. cit.*, p. 265.
[27] See also W. H. Smith: *The St. Clair Papers.* (Cincinnati, 1882) Vol. II, p. 554.
[28] *Order Book Territorial Court 1798-1800 Ross County*, p. 1. In office of Clerk of Court, Chillicothe, Ohio.
[29] L. S. Evans, *op. cit.*, p. 144.

tive form of government whenever the population of the territory contained five thousand male voters. Accordingly in 1798 they elected a legislature and Dr. Tiffin was sent as a representative from Ross County.[80] Upon the assembling of the first Territorial Legislature at Cincinnati he was unanimously chosen speaker of the House of Representatives, which position he held until Ohio became a state. Dr. Tiffin, like the other political-minded southerners who had settled in the Virginia Military District, was strongly Republican and an ardent follower of Thomas Jefferson. It was soon apparent that a great political battle for Ohio Statehood was in the offing between Gov. St. Clair and his Federalist followers on one side and Dr. Tiffin and the Virginia Republicans on the other. When Congress passed the Enabling Act (Apr. 30 1802) providing for the creation of Ohio as a state, for the fixation of its boundaries and for holding a constitutional convention, Dr. Tiffin was very naturally elected a delegate to that convention and was chosen as its president. As president of this first constitutional convention his reputation as an able and honest parliamentarian was established. As a result of his popularity and recognized ability he was elected Governor of the newly created state of Ohio in 1803 without opposition and was reelected to that post in 1805. It was during his second term as Governor that he promptly and successfully arrested the Aaron Burr expedition on the Ohio River by dispatching troops to Blannerhasset's Island and for which action he received public praise from President Jefferson.[81] Before the expiration of his second term as Governor the Ohio General Assembly elected him to represent Ohio in the U. S. Senate for a term of six years beginning March 4, 1807. His wife having died in July, 1808, leaving his aged mother, who made her home with Dr. and Mrs. Tiffin, he resigned the office of senator at the close of the Xth congress in March 1809 and returned to Chillicothe where he hoped to retire from public life and devote

[80] This and the following list of public offices held by Dr. Tiffin are found in the Biographical Directory of the American Congress, *op. cit.* These data have been carefully checked and verified. See also E. H. Gilkey: *The Ohio Hundred Year Book.* Compiled from official records and published by the authority of the 74th General Assembly (Columbus, 1901).

[81] *Jefferson's Writings*, vol. XI, 1905, p. 146.

himself to the practice of medicine.[83] In April, 1809, he married Miss Mary Porter of Ross County [84] and in October of that year he was elected a representative from Ross County to the Ohio General Assembly to fill a vacancy from that county. He was immediately chosen to serve as speaker of the House of Representatives. In 1810 he was reelected to the Ohio House of Representatives and was again chosen speaker. In 1812 President Madison appointed him Commissioner of the newly-created Office of Public Lands, now known as the Department of Interior, and he moved to Washington. He was in Washington in 1814 when the government buildings were burned by the British, and by his prompt action in removing the records of his office to Loudon County, Virginia, ten miles out of Washington, they were the only ones saved in their entirety from destruction.[85] In 1814, with the consent of President Madison and the U. S. Senate, he exchanged his office with Josiah Meigs for that of Surveyor-General of the Northwest and returned to Chillicothe. He held that office during the presidential terms of Madison, Monroe, John Quincy Adams and into that of Andrew Jackson, by whom he was removed July 1, 1829.[86]

Williams, who was his chief clerk during the fifteen years he was Surveyor-General, claimed [86] that Dr. Tiffin had long been subject to occasional attacks of severe nervous headaches, which gradually advanced upon him and that during the last four or five years of his life most of his time was spent in bed. His death occurred on August 9, 1829.

One Ohio historian [87] makes the statement that after Dr. Tiffin's arrival in Chillicothe he was too much in demand as a public man to give much time to his practice. In view of his political activities in the Northwest Territory one naturally arrives at this same conclusion. Nevertheless, there is abundant evidence to show that he continued to practice medicine almost up to the time of his death. In

[83] W. E. Gilmore, *op. cit.*, p. 119; Williams in Finley's Sketches, *op. cit.*, p. 275.
[84] *The Supporter*, Chillicothe, Ohio, Apr. 1809, contains the announcement of this marriage.
[85] Williams: Leaves from an Autobiography, *op. cit.*, Vol. 13, 1854, p. 158.
[86] Williams in Finley's Sketches, *op. cit.*, p. 281.
[86] *Op. cit.*, p. 280.
[87] Evans, *op. cit.*, p. 219.

one of his biographies, compiled by his son-in-law, Dr. C. G. Comegys of Cincinnati,[38] is the following statement " As a surgeon and physician he stood in the front rank of the men of his time, and several instances are remembered that show how ready he was to employ the highest resources of his art under sudden emergencies." He then goes on to relate that Dr. Tiffin while making sick calls was asked to see a patient with a badly infected foot. The patient lived several miles from Chillicothe and for Dr. Tiffin to have delayed till he could get his surgical instruments would have been fatal. He, therefore, performed an emergency amputation, using his penknife and a common hand-saw. According to the story he thereby saved the man's life. Williams also tells[39] about Dr. Tiffin performing a mastectomy on a woman " with an inflammatory disease in one of her breasts. This critical operation he performed successfully and the patient's life was saved." Both Comegys and Williams claim that Dr. Tiffiin no longer engaged in the active practice of medicine after his appointment as Surveyor-General in 1814 but that he continued to dispense advice and medicines from his residence gratuitously to the needy and to many of his former patients who still insisted upon consulting him. Williams says, " I have known him to be employed for hours together attending to the cases of the sick, in inquiring into the symptoms, in giving advice, writing prescriptions and making up packages of medicines, even when he was scarcely able to be out of bed or actually confined to it."

Several of his letters prove conclusively he still engaged in active practice following the height of his active political career. For example, in a letter dated Oct. 31, 1811 at Chillicothe, Ohio he says " I find I shall not be able long to undergo the drudgery of country practice. It is too hard on me. Yet I wish to be as useful as my health and strength will permit."[40] In a letter to Josiah Meigs, Jan. 15, 1812, Dr. Tiffin relates, " There have been more accidents in this neighborhood than I have ever known in a season. Keys has lost a finger the effects of being bit by Joe Miller—Toops, one of your

[38] *Op. cit.*, p. 6.
[39] *Op. cit.*, p. 275.
[40] MS. Letter, in Tiffin Collection, Library of Ohio State Archaeological and Historical Society.

tenants, is laying at old Ben's like to lose a leg or life—the whole of the large tibia bone will assuredly come out—indeed I expected yesterday to have had to take it off and also an arm for a poor wretched man who got his chewed in a fight and was in a state of mortification." [41] Also worthy of your attention is Dr. Tiffin's prescription book which was found in the Tiffin Collection in the library of the Western Reserve Historical Society, Cleveland, Ohio.[42] On its inside cover is his familiar signature, and the date Nov. 9, 1822 which was 8 years after his retirement from active practice, if Comegys and Williams were correct in their statement. As can be well imagined examination of this book proved extremely interesting, since it furnished valuable evidence as to his methods of treatment and the names of the medical journals and books he read, since he often indicated the reference from which he copied a prescription.

In an address at the Centennial Celebration of the adoption of Ohio's first constitution held at Chillicothe, November 29, 1902 [43] Mr. William McClintick recalled that in his childhood he had the honor of having a tooth pulled by Dr. Tiffin. Aside from the fact that this statement is the only one found coming from the pen of one of Dr. Tiffin's patients, is the approximate date of this memorable event in McClintick's life, and its bearing on the question of how long Dr. Tiffin was in active practice. McClintick was born in Chillicothe on Feb. 20, 1819.[44] It is not likely that he would have had need for an extraction until he was at least six years of age, which would place the date sometime around the year 1825, that is about four years prior to Dr. Tiffin's death.

According to Randall and Ryan [45] as a result of Dr. Tiffin's professional calls during which he covered many miles of travel in the sparsely settled Scioto Valley, he formed the friendships that explain much of his popularity in his political career. In their discussion of the great political battle which waged in the Northwest Territory for the creation of statehood for Ohio and in their assignment of

[41] *Ibid.*
[42] Tiffin Collection, MSS. No. 2128.
[43] Proc. Ohio Cent. Anni. Celeb., *op. cit.*, p. 8.
[44] *Ibid.*, p. 705.
[45] E. O. Randall and D. J. Ryan: *History of Ohio* (New York, 1912), Vol. III, p. 76.

credit to whom credit was due for its successful culmination is this pertinent remark, " The man who conducted all, who influenced all, who executed all, was the minister, physician, parliamentarian, governor, senator and honest man—Edward Tiffin of Chillicothe." As Galbreath points out in his *History of Ohio* [46] it is safe to say that Dr. Tiffin's record of universal popularity and the confidence of a constituency has never been equalled.

Yet in spite of the various political titles he held during his lifetime it is significant that to his contemporaries he continued to be known locally at least, as " Doctor Tiffin," which title he carried to his final resting place as evidenced by the fact that the name inscribed on the memorial shaft erected by his friends to his memory in Grandview cemetery, Chillicothe, Ohio, is " Doctor Edward Tiffin." Also it is worthy of note that his death notice, which was published in the Chillicothe *Scioto Gasette*, Aug. 12, 1829, reads as follows: " Died, at his residence in this place, on Sunday evening last, the 9th inst., Dr. Edward Tiffin, in the sixty-fourth year of his age."

[46] C. B. Galbreath (Chicago, New York, 1925), Vol. I, p. 274.

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EDWARD CLARK STREETER

1874 – 1947

MEDICO-HISTORICAL NEWS AND ACTIVITIES

NATIONAL NEWS

Edward Clark Streeter (1874-1947)

The death of Edward Clark Streeter at his home in Stonington, Connecticut, June 17, 1947, removed from the field of medicine an amateur historian who, with his contemporaries, William Osler, William H. Welch, Harvey Cushing, Arnold C. Klebs and Casey Wood, greatly influenced in the first three decades of the twentieth century the development of studies in the history of medicine in America. With him passed an era in American medicine, a period characterized by the impetus given to it by these men of scholarship, charm, book collecting instincts and the long purse. Streeter was not the least of this considerable group, although not so widely known because of his inherent modesty and his retiring nature. He seldom spoke in public, but when he did so he provided a rich feast for his audience.

Born in Chicago, November 10, 1874, Streeter graduated from Yale University in 1898 and received his degree of doctor of medicine from Northwestern University in 1901. After a period of practice in Chicago he toured Europe and studied in Paris, Vienna and Berlin. As a young man in Chicago he was soon attracted to medical history with a turbulent group of amateurs led by George H. Weaver, Ludvig Hektoen, and the ophthalmologists, Mortimer Frank and Casey Wood, who were already putting down the foundation stones of the Society of Medical History of Chicago, founded in 1909. To this group came the dynamic Arnold C. Klebs fresh from the European scene and no doubt well aware of the activities of the German Society for History of Medicine and Science, founded in Leipzig in 1901. Years later Streeter returned to the Chicago Club to read one of his most engaging papers on Leoniceno.[1]

After his marriage to Alice Martha Chase of Waterbury, Connecticut, on January 27, 1906, Streeter moved to Boston. Having retired from practice, he soon established a close connection with the Boston Medical Library and the Harvard Medical School, serving the latter institution as Lecturer on the History of Medicine from 1921 until he went to Stonington in 1929.

During the Boston period he made his chief contributions to medical history. These were largely in the field of art-anatomy and medicine during the Renaissance. He studied the Florentine artists and noted that their passion for uncompromising realism made essential the detailed study of surface anatomy. As bodies for dissection were scarce and only obtainable by the

[1] Edward C. Streeter: Leoniceno and the School of Ferrara, *Bull. Soc. Med. History of Chicago*, 1 (Chicago, 1911-1916): 18-22.

more powerful painters and sculptors, drawings and casts were handed down, specially the bronze statuettes of écorché, or flayed man.[3]

The whole subject of sculpture and painting as modes of anatomical illumination was considered in the scholarly paper by Garrison and Streeter,[4] published as a supplementary section to Frank's translation of Choulant's *History of Anatomical Illustration*, in 1919. For the history of early dissections he, with Charles Singer, made a study of miniature paintings used as illustrations of incunabula.[6]

Always interested in stimulating others, particularly medical students and young physicians, to collect books, Streeter, about 1922, issued a list of foreign dealers in old medical literature. This brief compilation of dealers and their addresses, privately printed, led many an unwary doctor into the happy field of collecting. His own books were selected with great care and used as a basis for his informal teaching of medical history.

In Boston he gave a few discerning students delightful evenings at his home on Beacon Street, following his appointment as Lecturer on the History of Medicine at the Harvard School in 1921. A few had been admitted to the inner sanctum before that date. No formal lectures were given at the school, but in a large room on the third floor of his house a selection of books was spread for an evening of discourse. Sitting back in his chair, cigar alight, he would talk, in a delightful voice and with great ease, for an hour or more in the most intimate fashion, taking the few gasping students, as if by the arm, around Florence and other centers of medicine and art in Italy and France, as if he were walking the streets of Boston. He was a master of exposition and indeed made living figures of Leoniceno, Ketham, Michele Savonarola, Fracastorius, Champier, Rabelais, Guy de Chauliac, Fernel, and his particular friends, Taddeo Alderotti, Antonio Benivieni and Thierry de Hery. Some of his own books, illustrating practice in fevers and plague, were put on exhibition at the Boston Public Library in 1921, at the time of the seventy-second annual meeting of the American Medical Association. A charming catalogue was printed by the Yale University Press.[5] The bulk of the collection was sold when Streeter left Boston and retired to Stonington in 1929, and it found a fitting resting place in the Library of the New York

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[3] Edward C. Streeter: An Unpublished Bronze Écorché, *Annals of Medical History*, 1 (New York, 1918): 73-74.

[4] Fielding H. Garrison and Edward C. Streeter: Sculpture and Painting as Modes of Anatomical Illustration, *Annals of Medical History*, 2 (New York, 1919): 305-329.

[6] E. C. Streeter and Charles Singer: Fifteenth Century Miniatures of Extramural Dissections. In: *Essays on the History of Medicine, presented to Karl Sudhoff on the occasion of his seventieth birthday, Nov. 26th, 1923*, Zurich, 1924.

[5] *Exhibit of Early Medical Texts Illustrating Practice in Fevers, Plague* &c. Boston, 6-10 June 1921. American Medical Association, Seventy-Second Annual Session. Boston: Privately printed by the Yale University Press, May, 1921.

Academy of Medicine. When the publication of Osler's Silliman Lectures, given in 1913, was postponed by the War and they were still unpublished after Osler's death, Streeter, with Garrison, Cushing and Mackall, saw them through the press in 1921, thus adding to the medical literature a delightful and useful book for students and physicians.[6] For Cushing's edition of Canano's *Musculorum Humani Corporis*, Streeter contributed a life of the Italian anatomist.[7] Unfortunately, his paper on "Economic Organization of the Medical Services," read at the dedication of the William H. Welch Medical Library, was never published, except in a brief abstract. Clever and humorous, Streeter not infrequently used picturesque phrases that catch in the mind. In the matter of attribution of some fourteenth century figurines of "muscle men," he writes that such experts as Dr. Bode and Goldschmidt "oscillate perpetually, like shore birds minus the hind toe." This splendid sense of humor is well shown in his impromptu skit with Osler, when Streeter, as Tyrunculus, is berated by the Chief for getting a precious volume at a book auction, long sought by Sir William.[8] In addition to the fun the paper discloses that Osler had been moved "more than once, when the Moon was in motion from the Meridian" to make "an attempt upon the life of Leonicenus." He could not shake himself free from the thought of it after completing his sketch of Linacre.

In Connecticut, Streeter found an old colonial farm, Red Brook, which he turned into a delightful home. His book shelves were relatively empty but he could not resist collecting. More books soon came to him, but his interest now turned to pharmacy and weights and measures. Rooms were rapidly filled and a whole early American drug shop was purchased. In a little over ten years his collection of weights and measures, with the books associated with them, could only be rivaled by a few collections, such as the one in the British Museum. These, with the pharmacy shop, he gave to the Historical Library at the Yale Medical School in New Haven when the Cushing wing was added in 1941. He was made Curator of the Museum Collections and the last years of his life were largely devoted to augmenting his extensive holdings.[9]

HENRY R. VIETS

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[6] William Osler. *The Evolution of Modern Medicine*. New Haven: Yale University Press, 1921.

[7] Giambattista Canano. Biographical Notice by Edward C. Streeter, In: Canano's *Musculorum Humani Corporis Picturata Dissectio* (Ferrara 1541?). Facsimile edition annotated by Harvey Cushing & Edward C. Streeter. Florence: R. Lier & Co. 1925.

[8] Edward Clark Streeter: Impromptu in a Library. Sir William Osler Memorial Number. *Bull. Internat. Assoc. of Med. Museums.* 9 (Montreal, 1926): 393-396.

[9] A bibliography of Dr. Streeter's publications has been prepared in the Historical Library of the Yale University School of Medicine. It will be published in the December 1947 issue of the *Yale Journal of Biology and Medicine*.

Cleveland, Ohio

The *Cleveland Health Museum News* (Sept., 1947) reports that an exhibit of "Prints of Medical Interest" is being held at the Cleveland Health Museum from October 1 to November 30, 1947. The prints had been collected by the Metropolitan Museum of Art in New York over a period of years and were first exhibited by the Metropolitan Museum in honor of the New York Academy of Medicine's centenary celebration. They "present medicine from the point of view of the layman rather than the specialist" and include such items as a Persian water color of ca. 1222 showing a physician preparing cough medicine, woodcuts from Vesalius' *De Fabrica* of 1543, William Hogarth's "The Reward of Cruelty," and a pen drawing of Thomas Eakin showing the Gross Clinic, Philadelphia.

Illinois State Medical Society

We read in the *Journal of the A. M. A.* (Aug. 30, 1947, p. 1558) that the Illinois State Medical Society is collecting materials for a complete medical history of Illinois from 1850 to the present. In 1927 a first volume which included the years up to 1850 was published under the editorship of Dr. Lucius H. Zeuch, and at least two more volumes are contemplated.

NEWS FROM ABROAD

Argentina

Dr. Aníbal Ruiz Moreno has been appointed Professor of Medical History at the University of Buenos Aires to fill the chair vacated by Dr. Juan Ramón Beltrán who became Professor of Legal Medicine.

International Association of Egyptologists

The International Association of Egyptologists has initiated the project to publish an annual Bibliography of books and articles devoted to Egyptology. This will start with works published from January 1, 1947, and the Editor of the Bibliography, Mr. Jozef Janssen (Hooigracht 15, Leiden, Holland) invites all who publish on this subject in the future to send him their papers. The Bibliography aims to give not only an alphabetical list of books and articles, but to publish also, if possible, a short outline of the contents.

The Wellcome Historical Medical Museum, London, England

An exhibit illustrative of the History of Surgery was prepared under the supervision of Dr. E. Ashworth Underwood, Director of the Museum, at the request of the officers of the 12th Congress of the International Society of Surgery. It was officially opened by Sir Alfred Webb-Johnson on the first day of the Congress in a gallery at the Science Museum at South Kensington lent for the purpose. It will be open to the public until February 1, 1948. There has been a weekly attendance of approximately 2,000 people.

BOOK REVIEWS

IGNACIO CHAVEZ. *México en la Cultura Médica.* Mexico, D. F.: Edición de el Colegio Nacional, Calle de Luis Gonzales Obregon 23, 1947. 187 pp., 63 ill.

This is a beautiful book and an important contribution to what I like to call "peripheral medicine." Up to about 1500 A. D. European medicine was hardly more advanced than Arabic or Indian or Chinese medicine. But then from the Renaissance on Europe decidedly became the centre of medical activities and progress. It was in Europe that the new science, that physics and chemistry had their great development and were used in the interpretation of the phenomena of health and disease. In Europe, on the basis of a new human anatomy a scientific physiology, pathology, and clinic developed which branched out into well-defined specialities. At the same time medicine had become rigid and remained mediaeval in the East, and from Morocco to China millions of patients were treated in the same way as their ancestors had been centuries before. For over 400 years Europe was the undisputed centre of medicine.

A centre has a periphery, and if we draw a large circle around Europe it will touch North, Central, and South America, Africa, the East and Russia. Some countries developed as colonies, others independently, but all were oriented toward Europe as far as medicine was concerned, and owing to their peripheral location their medical history followed in many respects the same line. All drew inspiration and knowledge from their native soil, that is, from their indigenous medicine whether it was primitive medicine or that of a past civilization. All in the beginning imported European physicians and institutions. The next step was taken when the native sons were sent to Europe for study until they could be trained at home, by foreign or foreign-trained professors in the beginning and finally by scientists born and bred in the country. The final step was reached when a country had become independent from Europe, had its own research and training centres, made its contribution to medical science and was able to train sufficient personnel of high calibre and to produce equipment in adequate quantity so that all the people of the country had all the health services that they needed.

All peripheral countries have a great deal in common, and yet they are all different in many ways on account of different geographic, social and economic conditions. The study of the history of medicine in these peripheral countries is fascinating, and I wish one of your younger medical historians would specialize in the subject. It would be a most rewarding field.

Mexico is a good example of such a peripheral country, and the present book is an unusually captivating one because it has been written by a truly great man, who has made medical history in his country perhaps more than

anybody else. A physician of profound culture, Dr. Chavez is one of the leading clinicians of his country and a cardiologist of world renown. Director of the Medical Faculty in 1933, of the Hospital General in 1937, the two medical foci of the nation, he initiated far-reaching reforms. In 1944 he created the National Institute of Cardiology, the first of its kind anywhere in the world, and under his leadership the most active medical research centre of the nation. The modern architecture of the building and the frescos of Diego Rivera that adorn it, express symbolically the progressive spirit of the institution.

Dr. Chavez has written some famous books on clinical subjects, on diseases of the kidneys and particularly of the heart, besides numerous papers. His present book is not meant to be a history of Mexican medicine, but rather, as the title indicates, a study of Mexico's place in the world of medicine. "I have attempted," the author says in the introduction, "to outline the path along which we have moved, to evaluate our effort, to reveal the sometimes hidden purpose of our reform movements, and I have endeavored to determine the goal toward which the efforts of various generations converge." Such a critical study, it is hoped, will inspire the young generation to carry on in the spirit of its predecessors and to bring to maturity the scientific tradition that was created under such hardships.

The history of Mexican medicine falls logically into four periods: 1. The period before the Conquest; 2. The colonial period, 1521-1821; 3. The reform movement that began in 1833; and 4. The post-revolutionary reform movement that set in around 1920.

When the Spaniards came to America, they encountered a highly developed culture in the land of the Aztecs, Toltecs, Mayas, and other tribes that inhabited the territory of Mexico. It was a culture that reminds us in many ways of those of Egypt and Babylonia, with the difference that it was a culture without writing. Medicine was also similar in many respects to that of Egypt and Babylonia, a mixture of magic, religious, and empirico-rational views and procedures. This parallelism across the oceans is not astonishing because archaic medicine, that is, the medicine of the very early civilizations, has very much the same character everywhere.

Like the Egyptians, Babylonians, Indians and Chinese, the people of Mexico had a certain nosological knowledge and differentiated between various disease entities. They diagnosed causes of disease, and treatments consisted of bloodletting, massage, hot baths, diets and a great variety of drugs. Hernandez found 1,200 species that were used as drugs by the natives. They also had skillful surgeons who knew how to treat fractures and dislocations, opened and drained abscesses, sutured wounds and trephined the skull, giving the drugs toloache or peyote for anesthesia. In obstetrics they practised embryotomy when the child was dead, and they practised a version of the embryo through external manipulations.

Ancient Mexican medicine was so similar to that of other ancient civiliza-

tions that it could not contribute new theories or techniques to Europe. Its great contribution was in another field,—it gave Europe new foods, new spices, and new drugs. Never had European materia medica been so enriched as it was when the American continent was opened up.

Indian and Chinese civilizations continued for thousands of years, and conquerors were assimilated. Egyptian life went on for centuries in spite of conquest and foreign administration. But the ancient civilization of Mexico was destroyed over night as a pagan civilization. There was no compromise, no wooing of the natives; they either embraced the conqueror's creed or were wiped out. And with the conqueror came smallpox and typhus that decimated the population. Spain, however not only destroyed but unlike other colonial powers that were interested in the welfare of their colonists only, it gave Mexico all it had, and that was much,—hospitals, foundling asylums, convalescent and mental hospitals, leprosaria, schools, printing presses, a university. Three years after the conquest Cortes founded the Hospital de la Limpia Concepción, later named Hospital de Jesús, the oldest still existing hospital of the continent. Ten hospitals were founded in the capital and 20 in the provinces in the 16th century alone. An ordinance of 1527 forbade the practice of medicine to unqualified individuals. A Protomedico was appointed whose duty it was to check licenses, to inspect pharmacies and establish a fee tariff. The first foundling hospital was erected in Santa Fe de Tacubaya as early as 1532, and in 1536 the Imperial College of the Holy Cross was founded in Santiago Tlatelolco in which natives were instructed in the humanities so successfully that twenty years after the conquest Indian boys could be found speaking Latin as "elegantly as Cicero."

But the College also had a chair of medicine, and 1536 marks the year when European medicine was taught officially for the first time in the Western hemisphere. Native medicine, however, was cultivated also. Once the country was conquered and pacified, the Spaniards and particularly the Franciscans took much interest in the native arts, crafts, and skills and collected data wherever they could find them. It was in this college that Martin de la Cruz, a teacher of native medicine, wrote in Aztec the famous herbal that Badianus translated into Latin.

In 1551 the creation of a university was ordered, and it was opened two years later with a Faculty of Medicine that has remained the teaching centre of the country to the present day. In 1570 the first medical book was printed in America, the *Opera medicinalia* of Francisco Bravo. Dr. Chavez' book has at the end a very convenient chronological table that lists the various events, and in which the historian of American medicine will find many "firsts."

The development during the early colonial period was perfectly sound. Mexico had all the institutions, facilities and services that a Spanish province had. Medical instruction was the same as in Europe: a four-year course based on the interpretation of the works of Hippocrates, Galen and Avicenna,

with an occasional "anatomy." But time went on; a new experimental science was born in Europe. Academies were founded as centres of research; Harvey, the iatrochemists and iatrophysicists, Sydenham, Boerhaave, Haller, the school of Edinburgh and the school of Vienna paved the way for a new medical science, but Mexico remained untouched by the new trends, following traditional lines—as the homeland did. Protestant books were kept out, no matter what their content was.

One good move may be registered in the 18th century, the requirement in 1719 of two years of internship in the Hospital de Jesús for all medical graduates. And in 1772 the first medical periodical of the continent, the *Mercurio volante* was launched by Dr. José Antonio Bartolache. A bad move, however, was the foundation of the Escuela Real de Cirugía, the Royal School of Surgery, that split the profession in Mexico as had happened in Spain. And as late as 1828, seven years after Independence, Hippocrates, Galen and Avicenna were still the official textbooks in the medical school.

A new, the third, period of Mexican medicine began in 1833, when the government closed the University and the School of Surgery and created the Establecimiento de Ciencias Médicas with a modern scientific program. Physicians all of a sudden realized how far behind other countries they were and how much they would have to learn. Freed from clerical control they set out to catch up with Europe. France, which following its great Revolution had the most modern medical schools of Europe, was the example that Mexico tried to emulate. Throughout the century, Mexican doctors went to Paris for study and training. The situation was very much the same as in the United States after the Civil War. Both peripheral countries made great efforts to learn from Europe, to reorganize their institutions and to win for themselves a place in world medicine.

It is impossible to discuss here the work of such men as José Perrés who introduced scientific methods into Mexican medicine, of the clinician Miguel Jiménez who like his North American counterpart William W. Gerhard differentiated between typhus and typhoid fever, of the founder of Mexican surgery Pedro Escobedo, of Rafael Lucio who did original research on leprosy. There were pioneers in every field of medicine who introduced into their country methods devised in Europe, and who developed them in their own way. In 1864 the National Academy of Medicine was founded. It was a heroic period of great efforts which succeeded in bringing modern scientific medicine to Mexico, to the centres at least, because outside the large cities medical conditions were still quite bad. and as a whole there was still much *verbalismo* as Dr. Chavez calls it, still much rhetoric, in Mexican medicine.

The Revolution interrupted developments for a decade but a new period began around 1920, the period of the developing specialties. Its centre was not the University but the Hospital General, where one specialized service after another was inaugurated. Brilliant young men were now available who

could be put in charge of these services. These in turn led to the foundation of specialized societies and journals. Post-graduate courses were held for the training of practitioners, and a number of these services branched out and developed institutions of their own. A Children's Hospital was opened in 1943, the National Institute of Cardiology in 1944, a Laboratory of Experimental Physiology in 1946, and the same year a Hospital for Nutritional Diseases and a National Institute of Nutrition were founded. They are all housed in beautiful modernistic buildings which aptly emphasize the new spirit that animates Mexican medicine.

It may seem strange that this promising new development originated in the General Hospital rather than in the University. Under the leadership of Dr. Chavez medical education was reorganized in 1933. He first modernized the plant, building laboratories for instruction and research, dissection rooms, lecture halls and a library. He then reorganized the curriculum and the method of recruiting teaching personnel. In all this he succeeded, but he failed in one point, namely when he tried to limit the admission of students to 300 a year. The number of medical students was increasing steadily, and it seemed obvious that it would soon exceed the facilities available.

I am not astonished that Dr. Chavez did not get this point through. The idea of a numerus clausus, generally accepted with us, is abhorrent wherever the continental European concept of the university is alive. According to this concept the university is an institution of learning that is open as a right and for a nominal fee to all citizens who qualify for entrance by having the baccalaureate. It gives every student a chance, but is not concerned about whether the student takes advantage of it or not. Academic freedom is interpreted in a very broad sense. This is all right, but the University of Mexico in 1946 had 5000 medical students, 1800 in the first-year class, and it is quite obvious that it is impossible to give adequate instruction in the laboratory, at the bedside of patients, in seminars when such masses are involved.

There is no doubt that Mexican medicine has progressed tremendously, particularly during the last 25 years. The country now has some brilliant researchers and specialists and some institutions that could not be surpassed. But the job is by no means completed, as Dr. Chavez fully realizes and frankly admits. Some branches of medicine such as psychiatry have not had their revolution yet. Medical education is not satisfactory, and this obviously affects the general standard of practice. Like many other countries, Mexico still has to solve its problem of rural health, although promising beginnings have been made in this field also.

Medicine is an indivisible whole that consists of general practitioner, specialist and researcher, of general and public health nurse, technician and other auxiliary personnel, of general and specialized hospital and dispensary, of laboratory, research institute and school. If one link in the chain is weak, or if a country has not the social organization required to make the re-

sources in personnel and equipment available to all the people in town and country, then the service obviously suffers and cannot reach its goal.

It is a delight to read Dr. Chavez' wise and profound disquisition. It has a philosophic breadth and warm enthusiasm that captivates one from the first page on. The pleasure is enhanced by the fact that the book is beautifully printed and lavishly illustrated. Mexico is our next-door neighbor, and I am sure that this is the kind of book that should by all means be translated into English. To the average North American doctor the rich culture of Mexico is very foreign, and he knows little about Mexican medicine, past and present. But here is a book that gives a splendid picture of the development and present conditions of one important aspect of Mexican culture, a tale of glories and failures, of heroic efforts and many achievements, of hopes and of the iron determination to improve conditions without respite. An English translation would undoubtedly contribute to a better understanding of our neighbor and would strengthen the ties between the medical corps of our two countries.

HENRY E. SIGERIST

JAMES ECKMAN. *Jerome Cardan.* Baltimore: The Johns Hopkins Press, 1946. [Supplements to the Bulletin of the History of Medicine, No. 7.] 120 pp. $2.00.

Jerome Cardan (1501-1576), illegitimate son of a Milanese lawyer, was brought up in a rough school; a sickly child, he was beaten by his mother and overworked by his father. Meanwhile he received some home instruction in the fundamentals of mathematics, logic, and astrology. In later life he mastered Latin and Greek. At twenty-five years of age he obtained a medical degree at the University of Padua, though with considerable difficulty. At both Padua and Milan, where he practiced medicine for a number of years, he was compelled to fight his way, due not only to professional rivalries, but also to the stigma of his illegitimate birth, and to his tactless disposition.

His first published work, *De Malo Recentiorum Medicorum Medendi Usu Libellus*, well exemplifies the last mentioned trait. The book was "conceived in rancor and spite," a fundamental temperamental characteristic that seems to have dominated much of his stormy career. It was with difficulty that he obtained successive professorships of medicine at Pavia, Milan, and Bologna. It was in the face of the bitter opposition of the College of Physicians at Milan that he built a reputation for remarkable cures and victorious disputations. Only in foreign parts, such as Paris, London and Edinburgh was he cordially received, and sometimes generously reimbursed for his services. To Cardan's dying day, trouble and enemies dogged his footsteps, especially in his native Italy. While a professor at Bologna he was imprisoned for several months (probably on suspicion of heresy) and eventually ostracized. He spent the remaining years of his life at Rome, practicing medicine,

destroying or rewriting his earlier works, and composing new ones. He died, as he had lived, fighting against a predominantly hostile world.

Throughout Captain Eckman's biography runs the *leit motiv* of a life dominated by the determination to win fame. This was the motivating factor in the composition of his autobiographical *De Vita Propria* and of his magnum opus on algebra, *Ars Magna*. The publication of the *Ars Magna* brought upon Cardan the charge of having plagiarized Niccolo Tartaglia's formula for solving cubic equations. Apropos of this controversial question, Captain Eckman accepts the traditional judgment as to Cardan's reprehensibility, but presents at considerable length certain mitigating circumstances. He approves the recent tendency to admit that Cardan was a ruthless competitor, but responsible nevertheless for noteworthy contributions in the field of medical, as well as, mathematical, science. He judiciously corrects Thorndike's judgment concerning Cardan's lack of interest in botany and anatomy. He also points out a number of Cardan's achievements in medicine; notably, the first description of typhus, improved treatments for asthma and pulmonary tuberculosis, and a shorter operation for hernia. His contributions in other scientific fields are treated with proper objectivity. Noteworthy in this connection is the author's proof that the "Cardan shaft" or universal joint, the mechanism of marionettes and the "Augsburg water machine," all of which were described by Cardan, are nevertheless traceable to earlier medieval scientists. All in all, Captain Eckman's factual data are well grounded.[1]

Our dominant impression with regard to this short volume is the dramatic story of an indomitable, and not always admirable, fighter caught in the cut-throat intellectual mêlée in which sixteenth-century Italian professors, physicians and writers seem constantly to have been involved. Of underlying interest is the precarious career of the University of Padua whose fame was "unequalled by any other university of the time," as Professor A. C. Krey tells us in the foreword. We trust that Captain Eckman "has not lost his interest in . . . the University of Padua" (p. ix), and that this interest will bring forth a definitive study thereon. If so, we hope that he will modify his literary methodology in one respect; viz., that he will put restraints on his antiquarian technique. He is, we are told (p. viii) an antiquarian, and our one recurring annoyance throughout the book was the excessive antiquarianism.

For instance, there must be some way of avoiding reader hazards such as the following (all on the same page, 61):

> It is significant that of the standard encyclopedias [96, 100, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241] that have appeared on the continent, not one omitted

[1] One of the noteworthy bibliographical by-products of his investigation is the proof that the oft-cited *Life and Times of Jerome Cardan* (by James Crossley; London, 1836) was never published.

the story of the relationship between Cardan and Tartaglia. . . . . Niccolo Tartaglia (1505-1557) of Brescia, who may [119, 243] or may not [243] have been largely self-educated,* at some time prior to 1536 came upon a method for the solution of equations of the third degree.

Doubtless it is this method of reference-noting [2] that enables the author to combine, at the end of the volume, his reference-notes with a sort of running bibliography, but the economy, if any, subjects the reader to unnecessary torture. Why not put all notes, both reference and explanatory, at the foot of the page where serious readers can find them without straining their patience?

If the *serious* reader deserves some such consideration, the *casual* reader also has rights. It seems unnecessary to bombard him with long quotations in Italian, French, German and Latin. They might be translated or abstracted into English, with the original text presented in footnotes. Similarly irksome (except to classicists) are the Latin chapter headings; somehow the "Foreword" and "Author's Note" escaped Latinization. While mentioning what impressed us as excessive antiquarianisms, we might list a few other items which failed to arouse our appreciation: viz., numerous "*supra*"s and "*infra*"s, "*famulus*" (constantly used for "servant"), and frequent, cumbersome Anglicizations such as "longevous," "necropsy," "anathematization," and "therapeusis."

The above criticisms, which may themselves be subject to the charge of pedantry, are made with all sincerity, in the hope that the author's history of the University of Padua will be written in such form as to attract a large reading public. We approve of scholarly paraphernalia (in footnotes and appendices). We look forward to an extended portrayal of the place of neglected Padua in the stream of Italian Renaissance civilization. Apropos of Renaissance civilization, the author's introductory remarks at the beginning of chapter III show an appreciation of the medieval background of Italian civilization. He is aware of the necessity of re-appraising the Italian Renaissance in the light of the northern renaissances of the ninth, tenth and twelfth centuries. In this connection, however, reference might be made to more recent and more substantial works than the textbooks of Brown and Thorndike (e. g., to Thorndike's *History of Magic and Experimental Science*, Taylor's *Medieval Mind*, and Darlington's excellent article on Gerbert in *American Historical Review*, vol. 52, p. 456). Finally, with regard to the *Renaissance of the Twelfth Century*, C. H. Haskin's notable work might be mentioned, and this renaissance should not be restricted to "the south of France."

LOREN MACKINNEY

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[2] Similar cases of excessive reference-note numbers occur on pages 12 (another twelve-number series), 25, 53, etc.

A Bibliography of Infantile Paralysis, 1789-1944. With selected abstracts and annotations. Prepared under direction of the National Foundation for Infantile Paralysis, edited by MORRIS FISHBEIN, compiled by LUDVIG HEKTOEN and ELLA M. SALMONSEN. Philadelphia, London, Montreal: J. B. Lippincott Co., 1946. 672 pp. $15.00.

The early history of poliomyelitis is still rather dark. The landmarks in the history of our knowledge of the disease are:

1840, when the German orthopedist Jakob Heine published the first monograph on the subject.

1890, when O. Medin in Sweden gave a classic description of an epidemic that had occurred in Stockholm, in a paper that established the epidemic character of the disease without any doubt.

1909, when K. Landsteiner and E. Popper succeeded in transmitting the disease to monkeys.

Infantile paralysis obviously occurred and was observed before 1840. Heine himself first discussed the subject in 1838 at the annual convention of the Gesellschaft deutscher Naturforscher und Aerzte in Freiburg i. Br. The present Bibliography lists 13 titles from 1789 to 1838 beginning with M. Underwood who in the second edition of his *Treatise on the diseases of children* under the heading "Debility of the lower extremities" unmistakably described symptoms of the disease. "Four remarkable cases of suddenly induced paralysis in the extremities, occurring in children, without any apparent cerebral or cerebrospinal lesion" were observed in 1835 in England by John Badham and described by him in the *London Medical Gazette* [1835-36, 17: 215-18]. Having no explanation for the disease, he urged his colleagues to look out for such cases of paralysis in children and to publish their observations. The paper was reported in the *Gazette médicale de Paris* [1835, p. 825]. Heine read it very carefully and found that he had treated over 20 such cases in his orthopedic hospital at Cannstatt.

A local epidemic occurred in Louisiana in 1841. Dr. G. Colmer who in Feliciana, La., saw "a child about a year old, then slowly recovering from an attack of hemiplegia," was told that 8 or 10 similar cases had occurred in the neighborhood during the preceding 3 or 4 months.

I have no doubt that a careful scrutiny of the medical literature of the 18th and early 19th centuries would reveal many more observations than are recorded in this Bibliography. And as usually happens when a disease has not been recognized yet as a separate entity, we may expect to find mention and even good descriptions of it in the non-medical literature. The Memoirs of Catherine the Great describe a paralysis in a boy of 1½ years of age that may well have been due to poliomyelitis.[1] The Memoirs of the Marquise de la Tour du Pin, a fugitive from the French Revolution in America, tell of

[1] *Memoirs of Catherine the Great*, transl. by K. Anthony, New York: Knopf, p. 5.

the sudden death of her little daughter in 1795 who "was taken from us by a sudden illness very common in this part of the country—a kind of infant paralysis. She died in a few hours without losing consciousness. The physician from Albany gave us no hope that she would live, and declared that this malady was then very common in the country and that no remedy was known." [2] F. G. Crookshank points out that Sir Walter Scott's account of the origin of his own lameness in 1773 is not only the earliest but one of the most precise of the early reports of a case of "infantile paralysis." [3]

How old is the disease and where did it originate? We have no way of answering the question with any degree of certainty. L. C. Ager thought that it was unknown in Europe before 1780 and that it was introduced into England at about that time by returning Anglo-Indians.[4] There may be some truth to this statement. The disease in all probability occurred in Europe before 1780, but how long before that date we cannot tell. And it is quite possible that it was introduced from the tropics, if not by Anglo-Indians, then in some other way. The tropics, after all, are the world's huge incubator in which for thousands of years all kinds of germs have been bred. Much has been written about poliomyelitis in ancient Egypt. The funeral stele of priest Ruma of the XVIIIth Dynasty that represents him with a highly atrophied right leg and a talipes equino-varus and walking with a stick is well-known. We cannot tell with certainty that the man had suffered from poliomyelitis, but it is very likely. The possibility that the deformity of Pharaoh Siptah's foot might have been the result of infantile paralysis was expressed by John Ruhräh,[5] and A. J. Levy thought that the disease existed in endemic form in Palestine during the Biblical period.[6] If these assumptions are correct, they would speak strongly in favor of an Eastern origin of the disease and at the same time of its antiquity.

The present Bibliography lists 454 titles before 1890.[7] Then after Medin's publication, increased attention was paid to the disease; more and more was written about it from the clinical and epidemiological point of view. The number of titles increased slowly until 1900, then rapidly in the 20th century. Today infantile paralysis is in the United States the disease for the study of which more money is spent—per case of death—than for any other disease, and few maladies have such elaborate bibliographies. President

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[2] See A. S. MacNalty, Epidemic poliomyelitis; epidemiology, causes and prevention; Chadwick lecture, *Brit. med. J.*, July 11, 1936, 2: 57 ff.

[3] See F. G. Crookshank, The story of a new disease; Chadwick lecture, *Med. Press*, 1918, 106: 291 ff.

[4] L. C. Ager, Infantile paralysis; history, diagnosis, and treatment, *New Albany med. Herald*, 1927, 36: 27 ff.

[5] J. Ruhräh, Poliomyelitis? *Am. J. Dis. Child.*, Jan. 1, 1932, 43: 195.

[6] A. J. Levy, Epidemiology of poliomyelitis in Palestine, *Med. Leaves*, 1942, 4: 22 ff.

[7] Actually a few more since there are a good many a's and b's.

Roosevelt drew it into the limelight, and the present book is justly dedicated to him "who, by his triumph over the most dreaded of crippling diseases, which could not conquer him, gave inspiration and courage to thousands of children, men and women similarly afflicted."

Research, however, was not limited to America. Serious epidemics that occurred in most European countries during the past decades stimulated research, and this Bibliography gives a good picture of the contribution of the various nations, although there must be gaps in the literature of the war years, gaps that will be filled in subsequent Supplements.

A chronological bibliography of 8320 titles would be almost worthless if it merely listed the literature without further ado. This Bibliography, however, is particularly well done in that it not only has an idex of authors and an excellent analytical subject index of almost 100 pages, but also gives selected abstracts and annotations so that you not only find the literature in which you are interested, but also get an idea of what the papers contain. This makes the Bibliography a tool that will be indispensable to all workers in the field.

HENRY E. SIGERIST

GERALD B. WEBB, and DESMOND POWELL. *Henry Sewall, Physiologist and Physician.* Baltimore: The Johns Hopkins Press, 1946. 191 p. $2.75.

Henry Sewall was a member of that now fast dwindling group of early students at the Johns Hopkins University who were the first fruits of that extraordinary academic tree which was planted in Baltimore by Johns Hopkins, watched over by Daniel Coit Gilman and nurtured and fertilized by such intellectual giants as Welch, Osler, Martin, Sylvester and others.

The son of a Methodist minister, Henry Sewall was born on May 25, 1855 in Winchester, Virginia. He seems to have inherited a tubercular constitution from his father and as a result of his sickliness his education was desultory. However in 1876 he graduated from Wesleyan College having prepared to enter the Harvard Medical School. This he was unable to do because of the loss of his paternal inheritance. However just at this time a new school, the Johns Hopkins University, was opening its doors in Baltimore. Sewall came to Baltimore, not only to carry on studies in physiology but also to find some work which could support him while he continued his studies. Henry Newell Martin took him on as an assistant and thus Henry Sewall began his career as a physiologist. In 1879 he took his doctorate and then went to Europe where he worked in Ludwig's laboratory and then went to England to spend some time with Sir Michael Foster.

Upon his return he was offered the chair of physiology at the University of Michigan and it was here that he did his famous work on immunization against snake venoms and laid the foundations for the development of

antitoxic immunity. Shortly after this work, his health being imperiled by tuberculosis he gave up his chair. In 1891 he went to Denver where he spent the rest of his life. There after an active career in practice, public health work and in teaching at the University of Colorado Medical School Henry Sewall died in 1936.

The authors of this welcome biography have done well their task of assembling and organizing a considerable mass of source materials and their lively account has recreated not only their subject but his time as well. Thus they have made another contribution to the medical history of one of the great periods in the history of American medicine.

The book is well illustrated and contains a bibliography of the writings of Henry Sewall.

MORRIS C. LEIKIND

BERTRAM M. BERNHEIM. *A surgeon's domain.* New York: W. W. Norton, 1947. 253 pp. $3.00.

Dr. Bernheim, Associate Professor of Surgery at the Johns Hopkins University, is not only an excellent surgeon and researcher who has made a name for himself particularly in the field of blood transfusion, but he is also a very good writer. His previous books of a general character, *Adventure in Blood Transfusion* and *Medicine at the Crossroads*, were widely read, and the latter stirred a great deal of controversy because Dr. Bernheim is unorthodox in social and medical matters. This is rather strange because we expect a successful surgeon who has reached the top of the ladder, being on the faculty of one of the first medical schools of the country, visiting surgeon to the best hospitals of his community, a Fellow and founder of the American College of Surgeons, a member of the American Board of Surgery, a Fellow of the American Medical Association—we expect such a man to be a conservative because the existing order has worked very well as far as he is concerned. But not so Dr. Bernheim, who in his present book—which by the way was granted the Norton Medical Award—says, "What doctors need most urgently is emancipation—emancipation from a social order that is dead. They are free scientifically. If they could only see that the scientific and the social go hand in hand and that neither can attain fulfillment alone."

This is strong language that we are not accustomed to hear from a successful surgeon. Dr. Bernheim expresses progressive views on a number of other subjects. He is justly upset about the cold loveless atmosphere of the waiting rooms of most of our dispensaries where people, patients, sit and wait in idleness for hours. I wish he had seen the waiting rooms of some Russian dispensaries where no effort is spared to make the people feel at home with pleasant furniture, flowers, books and magazines, where

health education is carried on with exhibits, movies and all kinds of gadgets, at a moment when people are very responsive, and where a girl plays with the children or tells them stories. The problem can be solved easily, with little money, but it requires some imagination and the awareness of it.

A much more difficult problem is raised by the shortage of nurses. Dr. Bernheim justly points out that doctor, nurse and hospital present a tripartite arrangement that is required for good medical care. If one of the three falls down, the service suffers by necessity. We have a shortage of hospital beds, but this will be attended to with government aid. The shortage of nurses is a serious matter, and it is hard to tell how it may be overcome. In a free economy production and prices are determined by demand and supply. Since there is more demand for nurses than are available, the price of the service, that is, the nurses' salaries, should go up considerably so as to attract more girls to the profession. Under the rules of economic competition, however, salaries may easily become such that hospitals and patients cannot afford to pay them. Dr. Bernheim suggests, and again we agree wholeheartedly with him, that we need different categories of nurses. The experience of the war years with nurses' aids and other voluntary workers has shown unmistakably that many services can be rendered by women who have not had the full nurses' course of three years' training. Dr. Bernheim's suggestion of having in addition to the fully trained nurse one who had only a one-year course is realistic and sound. The only difficulty I can foresee is that the salary of this category of nurses may not be large enough to make the job attractive.

The book obviously deals mostly with the surgeon's training and calling, with the joys and sorrows of his profession, with good surgery and bad surgery. Dr. Bernheim has a wealth of reminiscences from which he draws freely and of which he tells us informally in a sometimes slangy and chatty way. His description of the first operation he saw as a young medical student makes me realize that I have no recollection whatever of the first operation I saw, while I remember my first clinical case, a mitral stenosis, in every detail. This merely shows that the students' attitude toward surgery varies a great deal. "There is no royal road to surgery," Dr. Bernheim tells us, "on the contrary, it is hard, rocky, tortuous and uphill." The surgeon must be strong, and if he is not drenched in sweat after an operation there is something wrong with him. There is a dramatic description of an exploratory operation and a good discussion of the various types of patients. By the way, the popular custom of treating burns with ink is not as silly as it sounds because ink contains or at least used to contain tannic acid. In the sixteenth century surgeons used this treatment frequently.

Dr. Bernheim, as we would expect, discusses the economics of surgery and the wasteful present system under which a young surgeon after many years of training goes into private practice, sits in his office and waits for patients. The young physician is better off because people are more inclined

to give him a chance, to try him out, but who would put his life into the hands of an unknown young surgeon? Dr. Bernheim's idea is that the surgeon's place is not in private practice but in the hospital, and that all surgeons should be on salaries. Such salaries would be graded, of course, according to experience and responsibility, but such a system would eliminate most of the present shortcomings and should be satisfactory to patient as well as surgeon. The experience of the Mayo Clinic, Ford Hospital and similar institutions confirms such a view, and I am sure that young people would welcome a system that would give them economic security and the possibility of making the best use of their knowledge and skill without delay.

Somewhere in the beginning of the book Dr. Bernheim says "that the higher-ups in medicine know too little at first hand of the lower-downs and that therein lies much of the trouble—because it is the higher-ups who run the show." It is good to know that among the higher-ups there are some, like Dr. Bernheim, who have a sympathetic understanding of the lower-downs, who have the courage to face the problems of medical care squarely and the imagination and wisdom to make constructive suggestions for improving the present situation.

HENRY E. SIGERIST